CITY OF FREDERICK
MANUAL OF
STANDARD DETAILS
FOR CONSTRUCTION

DEPARTMENT OF ENGINEERING
140 W. PATRICK STREET
FREDERICK, MD 21701
301-600-1498
www.cityoffrederick.com
Approved & Adopted: March 2017

CITY OF FREDERICK
STANDARD DETAILS FOR CONSTRUCTION

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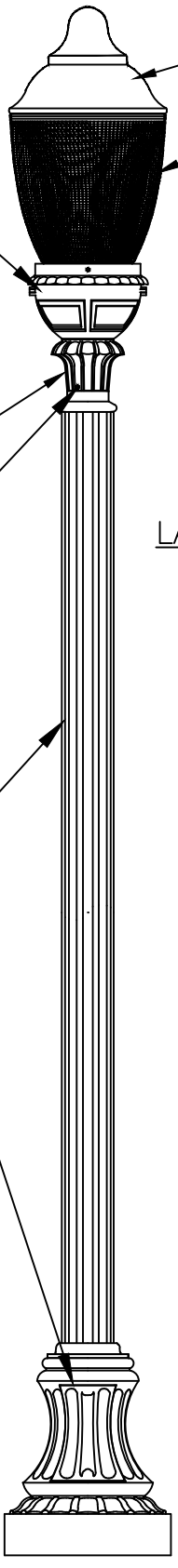
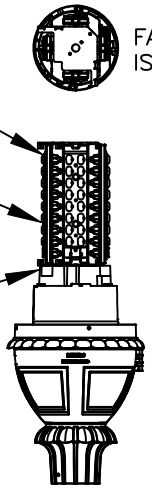
NUMBER	TITLE
	WATER DETAILS
W–1.0	WATER MANHOLE COVER
W–1.1	WATER MANHOLE FRAME
W–2.0	FIRE HYDRANT SETTING DETAIL
W–2.1	FIRE HYDRANT STRAP TEE
W–3.0	TEMPORARY CAP & BLOW OFF
W–4.0	ANCHOR BLOCK
W–5.0	WATER/GAS VALVE ADJUSTMENT
W–6.0	ANCHORING VALVE TO TEE WITH "DUC–LUGS" METHOD
W–6.1	MECHANICAL JOINT FITTING
W–7.0	TAPPING SLEEVE & VALVE EXCAVATION
W–8.0	DEWATERING DEVICE
W–9.0	NON–RESIDENTIAL METER SETTING SERVICE THROUGH FLOOR
W–9.1	NON–RESIDENTIAL METER SETTING SERVICE THROUGH WALL
W–9.2	RESIDENTIAL METER SETTING SERVICE & FIRE LINE FOR SPRINKLERS
W–10.0	WATER HOUSE CONNECTION FOR INSIDE DWELLING METER
W–10.1	STANDARD INSTALLATION 1" METERED DOMESTIC SERVICE (DOWNTOWN ONLY)
W–10.2	DOUBLE WATER HOUSE CONNECTION (TOWNHOUSE ONLY)
W–10.3	TAP SIZES AND PIPE CLASS FOR WATER HOUSE CONNECTIONS
W–11.0	STANDARD WATER METER VAULT
W–12.0	TYPICAL WATER MAIN VERTICAL OFFSET TYING
W–13.0	BUTTRESS FOR TEES
W–14.0	BUTTRESS FOR CAPS
W–15.0	BUTTRESS FOR HORIZONTAL AND VERTICAL BENDS
W–16.0	AIR RELEASE VALVE MANHOLE
W–17.0	SPECIAL AIR RELEASE VALVE
W–18.0	METHOD OF TESTING WATER MAINS
W–19.0	WATER VALVE BOX
W–20.0	EXTENSION STEMS AND VALVE BOXES FOR DEEP VALVE SETTINGS
W–20.1	EXTENSION STEMS AND VALVE BOXES FOR DEEP VALVE SETTINGS
W–20.2	VALVE EXTENSION STEM FOR CITY VALVE BOXES
W–21.0	WATER VALVE TIE STANDARD SHEET GENERAL NOTES
W–21.1	WATER VALVE TIE STANDARD SHEET GENERAL NOTES
W–21.2	WATER VALVE TIE EXAMPLE DRAWING

ELECTRICAL DETAILS

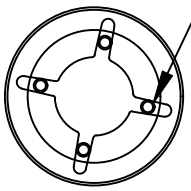
FIXTURE DIMENSIONS
HEIGHT: 38"
WIDTH: 15"



LAMP & POLE DETAIL
NTS



LAMPING DETAIL
NTS



8"-13" BOLT CIRCLE
4 SLOTS - 90° APART
BASE WIDTH: 18" DIA.

BASE DETAIL
NTS

NOTES:

1. ROADWAY CONDUIT CROSSINGS SHALL BE 30" BELOW FINISHED GRADE TO TOP OF CONDUIT.
2. DRIVEWAY CONDUIT AND SIDEWALK CONDUIT CROSSINGS SHALL BE 24" BELOW FINISHED GRADE TO TOP OF CONDUIT.
3. A #6 COPPER STRANDED GROUND CONDUCTOR SHALL BE PULLED FROM MAIN SERVICE PANEL TO EACH STREET LIGHT POLE HANDHOLE WHERE IT SHALL BE TERMINATED WITH A 3-WAY COMPRESSION CONNECTOR OR COPPER SPLIT BOLT. THE TAP OFF OF THE COMPRESSION CONNECTOR OR SPLIT BOLT SHALL BE BONDED TO POLE WITH A COPPER LUG.
4. WIRING FROM FUSE HOLDER TO FIXTURE SHALL BE 14/3 SEO CABLE, PROPERLY ATTACHED TO FIXTURE WITH CABLE SUPPORTING GRIP
5. A 1/4" THREADED GROUND STUD SHALL BE WELDED TO POLE BASE.
6. CONDUCTORS SHALL BE FUSED WITH FUSE HOLDER AND BAF 3 AMP FOR EACH INDIVIDUAL FIXTURE. BUSS #HEB - JK AND/OR JJ.
7. ALL TERMINATION NOT IN FUSE HOLDERS SHALL BE TERMINATED WITH A 3-WAY COMPRESSION CONNECTOR OR COPPER SPLITBOLT.
8. ALL TERMINATIONS SHALL BE TAPED THEN PUDDY TAPED AND TAPED AGAIN.
9. WEATHERPROOF RECEPTACLES TO BE USED IN THE HISTORIC DISTRICT.
10. CONTRACTOR SHALL PROVIDE SUBMITTALS FOR APPROVAL PRIOR TO ORDERING EQUIPMENT
11. THIS DETAIL IS FOR REFERENCE PURPOSES ONLY & CAN DIFFER IF WORKING IN AN EXISTING RESIDENTIAL AREA. PLEASE CONTACT THE FREDERICK CITY INSPECTOR PRIOR TO INSTALLATION

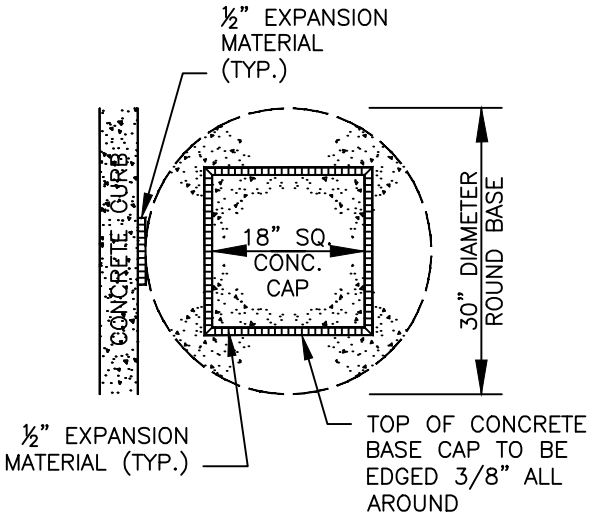
The City of Frederick Maryland

RESIDENTIAL STREET LIGHTING

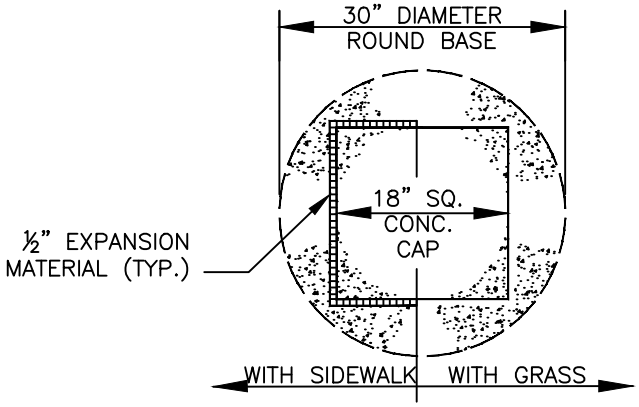
APPROVED: Zachary J. Kershner
DIRECTOR-DEPARTMENT PUBLIC WORKS

E-1.0

MARCH 2017

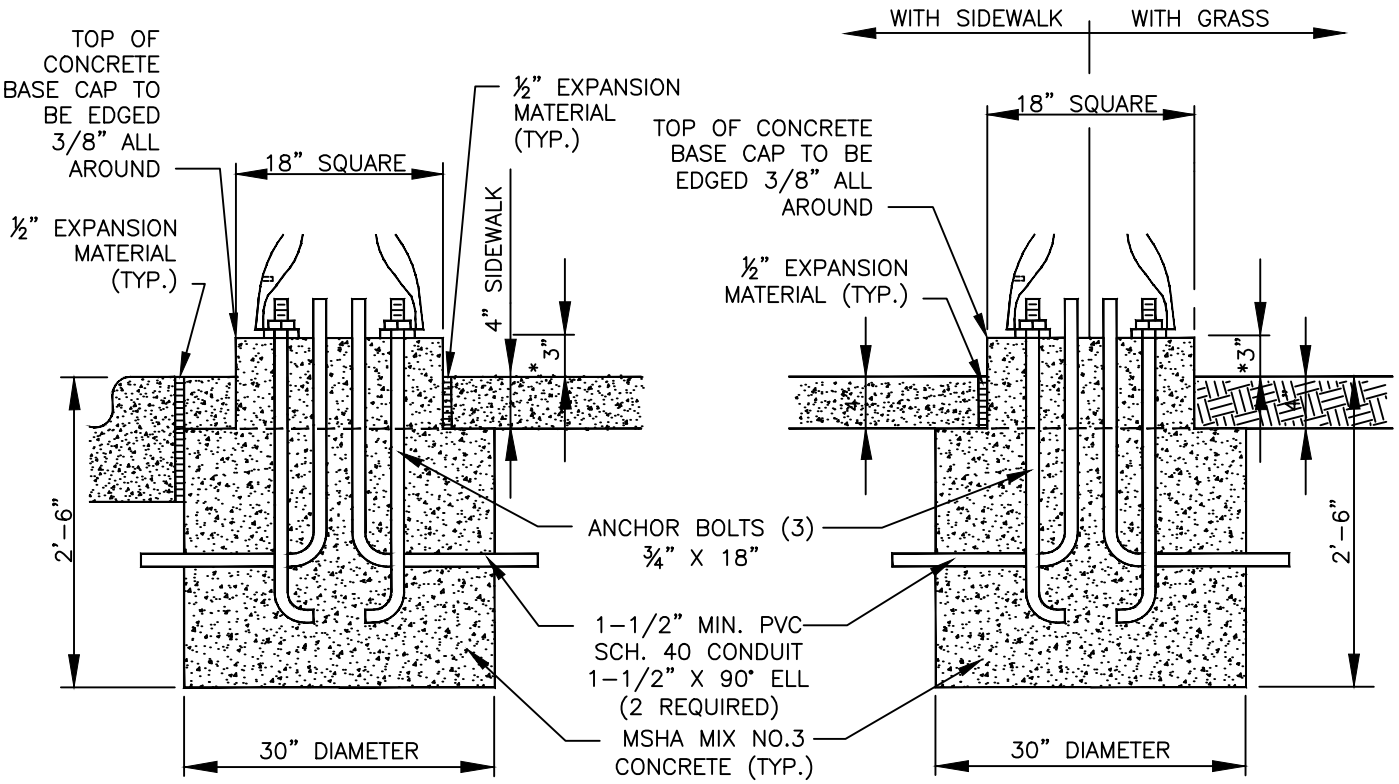


CONCRETE BASE WITH CURB



CONCRETE BASE WITHOUT CURB

PLAN
NTS



CONCRETE BASE WITH CURB

CONCRETE BASE WITHOUT CURB

SECTION
NTS

* POUR CONCRETE BASE CAP 3" HIGHER THAN HIGH SIDE OF SIDEWALK OR GRASS AREAS FOR STREET LIGHT PEDESTAL. NO SHIMS ALLOWED.

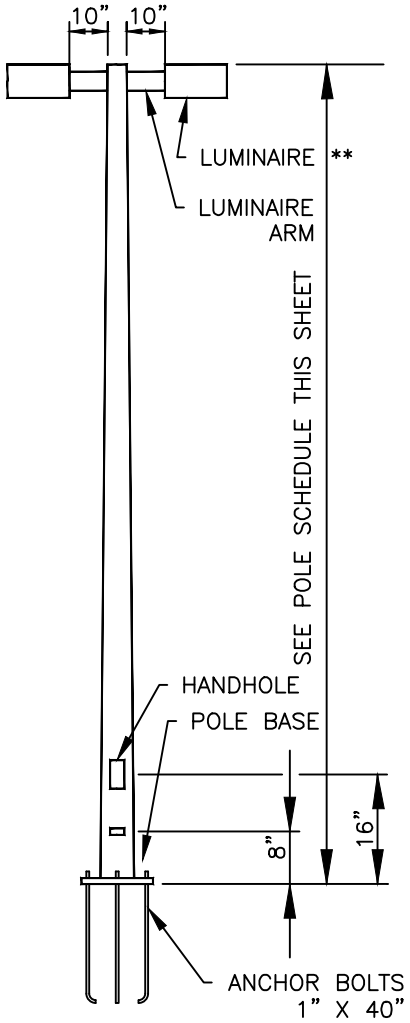
The City of Frederick Maryland

ROUND BASE FOR RESIDENTIAL STREET LIGHTING WITH CONCRETE CURB

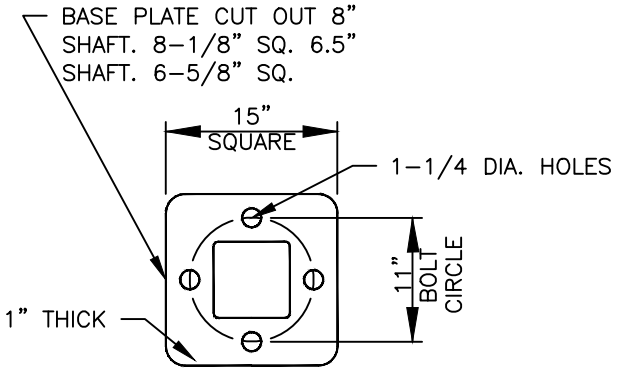
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

E-1.1

MARCH 2017



FRED 1 POLE
NTS



BASE PLATE
NTS

NOTES:

1. ROADWAY CONDUIT CROSSINGS SHALL BE 30" BELOW FINISHED GRADE TO TOP OF CONDUIT.
2. DRIVEWAY CONDUIT AND SIDEWALK CONDUIT CROSSINGS SHALL BE 24" BELOW FINISHED GRADE TO TOP OF CONDUIT.
3. A #6 COPPER STRANDED GROUND CONDUCTOR SHALL BE PULLED FROM MAIN SERVICE PANEL TO EACH STREET LIGHT POLE HANDHOLE WHERE IT SHALL BE TERMINATED WITH A 3-WAY COMPRESSION CONNECTOR OR COPPER SPLIT BOLT. THE TAP OFF OF THE COMPRESSION CONNECTOR OR SPLIT BOLT SHALL BE BONDED TO POLE WITH A COPPER LUG.
4. WIRING FROM FUSE HOLDER TO FIXTURE SHALL BE 14/3 SEO CABLE, PROPERLY ATTACHED TO FIXTURE WITH CABLE SUPPORTING GRIP
5. A 1/4" THREADED GROUND STUD SHALL BE WELDED TO POLE BASE.
6. CONDUCTORS SHALL BE FUSED WITH FUSE HOLDER AND BAF 3 AMP FOR EACH INDIVIDUAL FIXTURE. BUSS #HEB – JK AND/OR JJ.
7. ALL TERMINATION NOT IN FUSE HOLDERS SHALL BE TERMINATED WITH A 3-WAY COMPRESSION CONNECTOR OR COPPER SPLITBOLT.
8. ALL TERMINATIONS SHALL BE TAPED THEN PUDDY TAPED AND TAPED AGAIN.
9. THIS DETAIL IS FOR REFERENCE PURPOSES ONLY & CAN DIFFER IF WORKING IN AN EXISTING RESIDENTIAL AREA. PLEASE CONTACT THE FREDERICK CITY INSPECTOR PRIOR TO INSTALLATION

POLE DATA								*LOADING DATA	
POLE TYPE	HEIGHT (FT.)	LUMINAIRE ARM SINGLE(S) DOUBLE(D)	LUMINAIRE ARM ARM SPAN (FT.)	BASE SQUARE SIZE	TOP SQUARE SIZE	WALL THK. (GA.)	LENGTH (FT.)	MAXIMUM E.P.A. (FT^2)	MAXIMUM WT. (LBS)
FRED 1	30	S OR D	------	7.70"	4.40"	11	30	18.5	200

* MAXIMUM E.P.A. AND WEIGHT VALUES BASED ON AN ISOTACH WIND VELOCITY OF 80 M.P.H. X 1.3 GUST
** LAMINAIRE TO BE TLM TALON MEDIUM LED OR APPROVED EQUAL

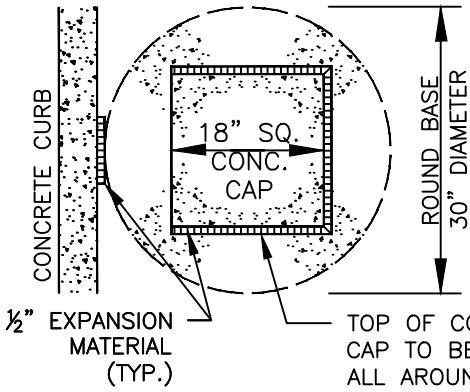
The City of Frederick Maryland

NON-RESIDENTIAL STREET LIGHTING

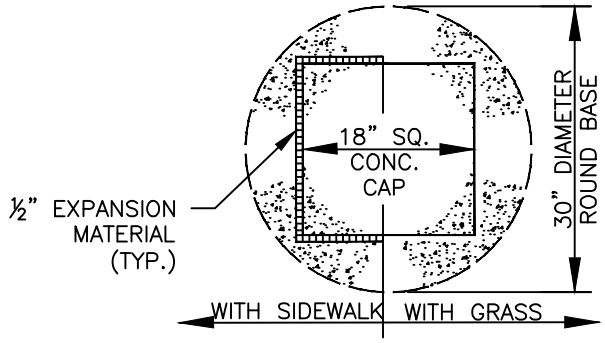
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

E-2.0

MARCH 2017

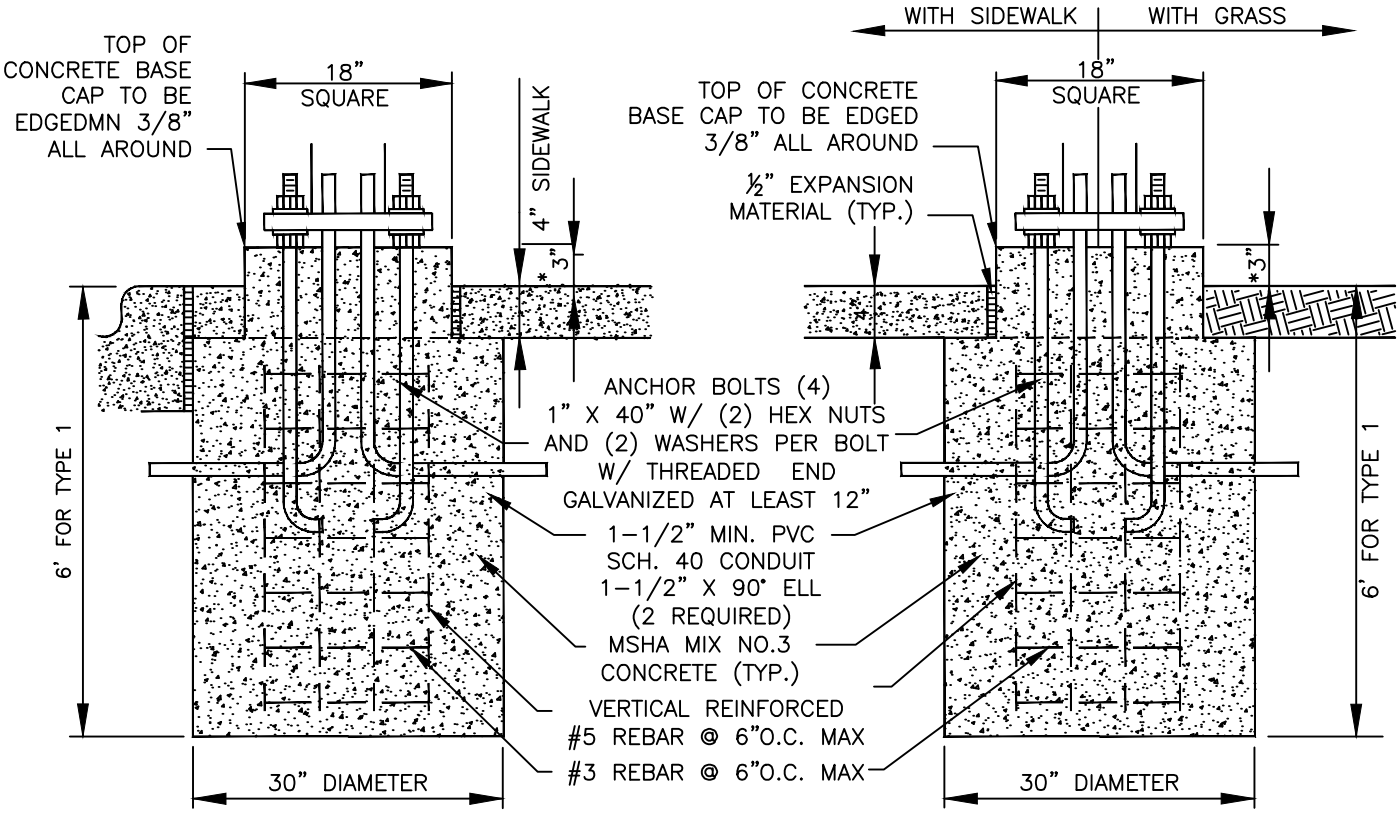


CONCRETE BASE WITH CURB



CONCRETE BASE WITHOUT CURB

PLAN VIEW
NTS



CONCRETE BASE WITH CURB

CONCRETE BASE WITHOUT CURB

SECTION
NTS

* POUR CONCRETE BASE CAP 3" HIGHER THAN HIGH SIDE OF SIDEWALK OR GRASS AREAS FOR STREET LIGHT PEDESTAL. NO SHIMS ALLOWED.

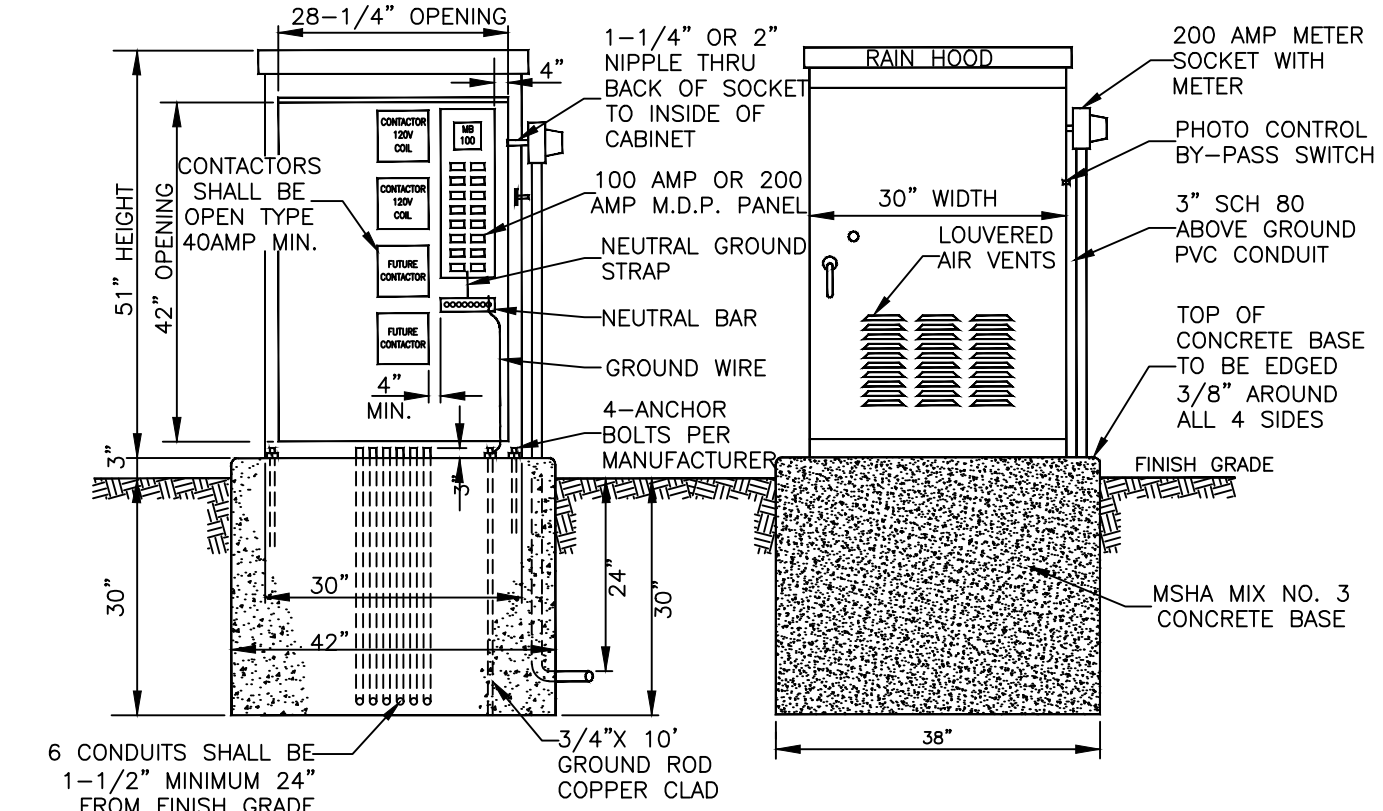
The City of Frederick Maryland

NON-RESIDENTIAL STREET LIGHTING ROUND BASE

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

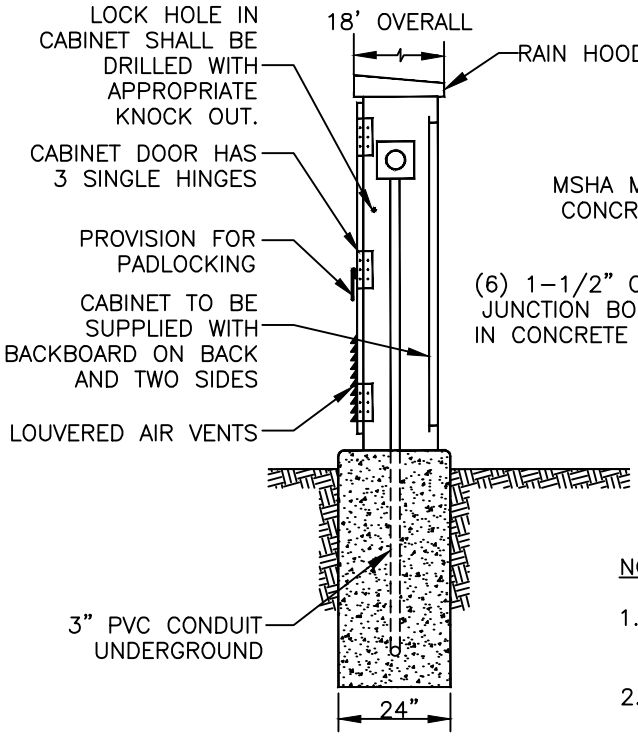
E-2.1

MARCH 2017

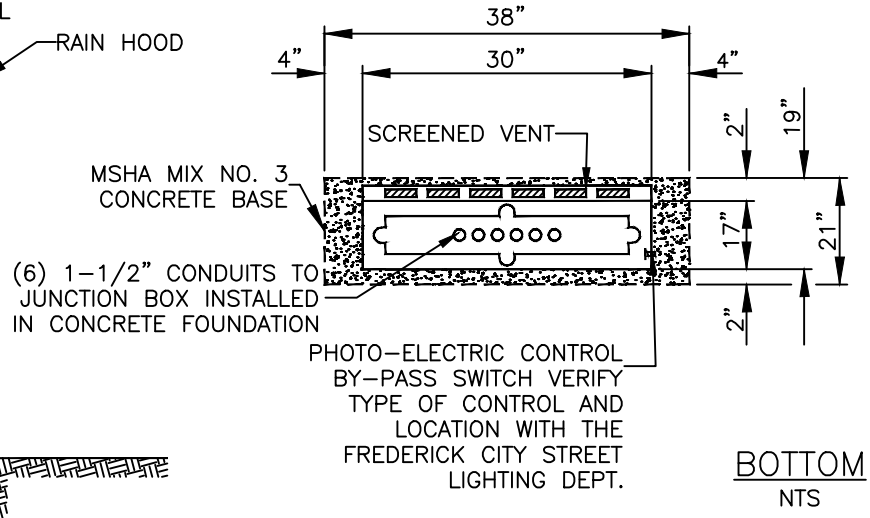


FRONT
(OPEN VIEW)
NTS

FRONT
(CLOSED VIEW)
NTS



SIDE
(CLOSED RIGHT SIDE)
NTS



BOTTOM
NTS

NOTES:

1. LIGHTING CABINET TO BE SIEMENS TYPE M CATALOG #EL702 OR APPROVED EQUAL.
2. ELECTRIC EYE TO BE INTERMATIC K4021C
3. THIS DETAIL IS FOR REFERENCE PURPOSES ONLY, PLEASE CONTACT THE FREDERICK CITY INSPECTOR PRIOR TO INSTALLATION.

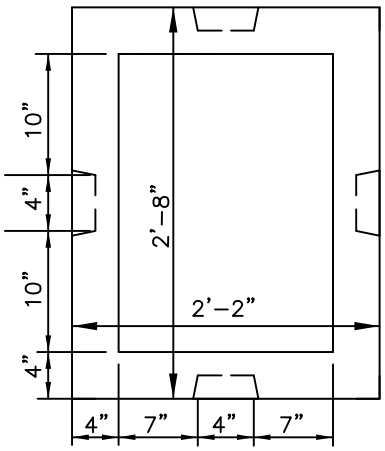
The City of Frederick Maryland

STREET LIGHTING CABINET

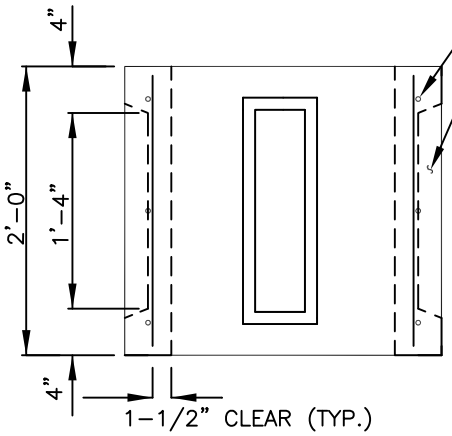
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

E-3.0

MARCH 2017



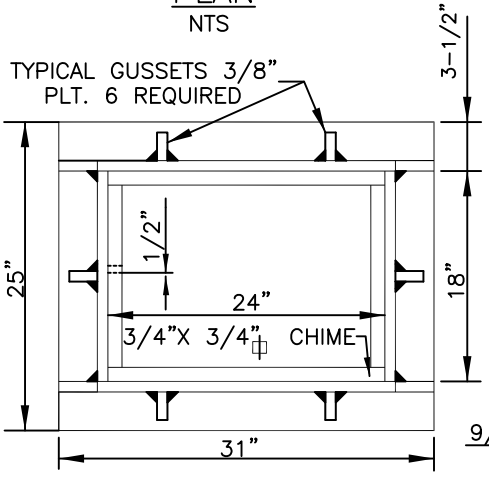
PLAN
NTS

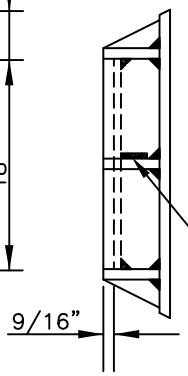


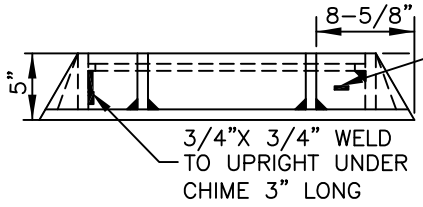
ELEVATION
NTS

NOTES:

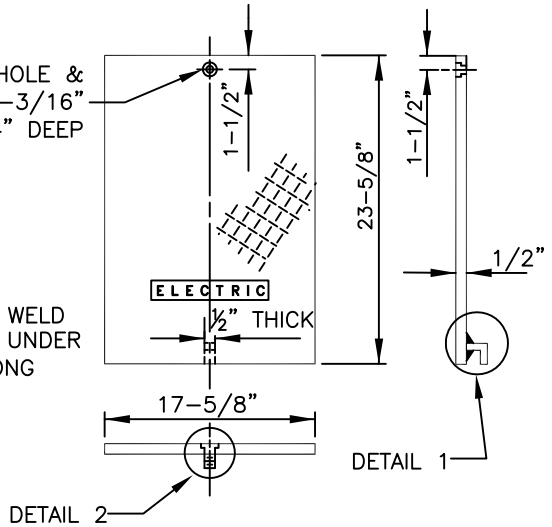
1. ELECTRICAL JUNCTION BOX IS NOT DESIGNED FOR H20 LOADING.
2. IF LOCATED IN ROADWAY, CONTRACTOR SHALL PROVIDE ELECTRICAL JUNCTION BOX DESIGNED FOR H20 LOADING.
3. ELECTRICAL JUNCTION BOX: 1'-6"X 2'-0"X 2'-0".



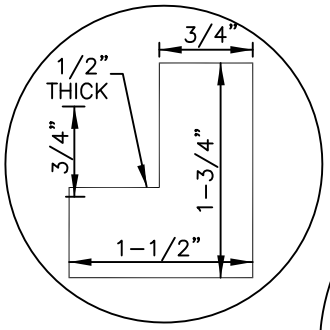




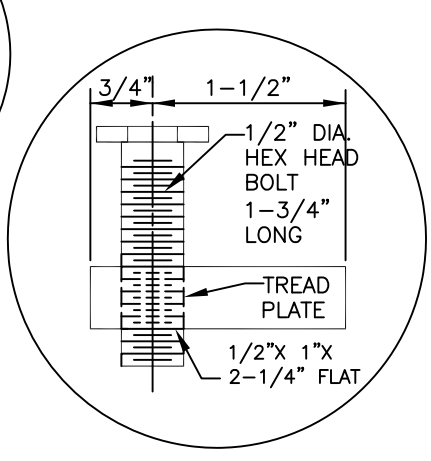
FRAME
NTS



COVER
NTS



DETAIL 1
NTS



DETAIL 2
NTS

FRAME & COVER NOTES:

1. PAINT ENTIRE ELECTRICAL JUNCTION BOX FRAME AND COVER WITH 2 COATS OF RED OXIDE PRIMER AND 2 COATS OF BENJAMIN MOORE RETARDO BRONZE TONE #163-60 OR APPROVED EQUAL.
2. ELECTRICAL JUNCTION BOX FRAME AND COVER TO BE CONSTRUCTED OF STEEL.
3. ELECTRICAL JUNCTION BOX AND COVER SHALL BE SET IN MORTAR ON TOP OF HAND HOLE BOXES.
4. THIS DETAIL IS FOR REFERENCE PURPOSES ONLY, PLEASE CONTACT THE FREDERICK CITY INSPECTOR PRIOR TO INSTALLATION.

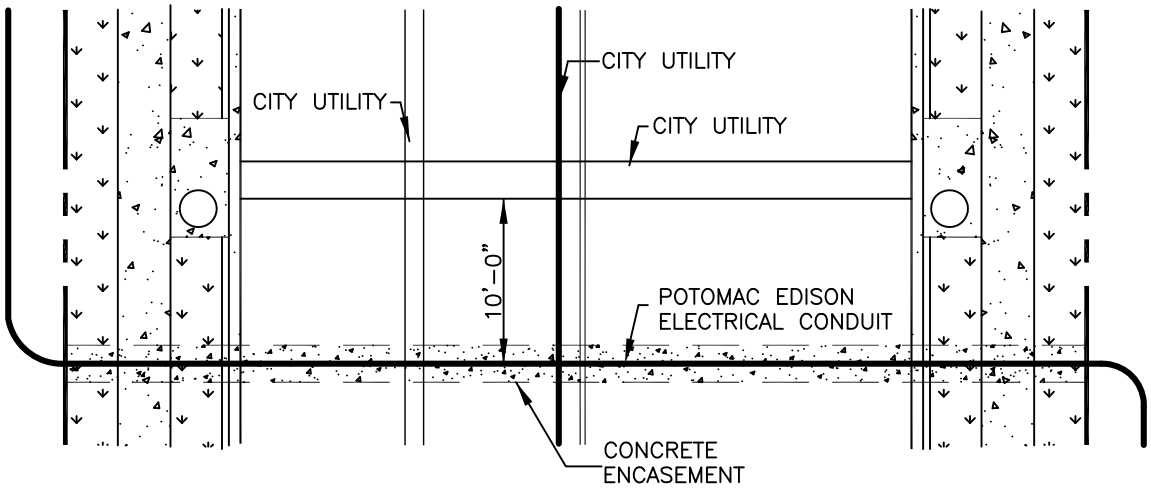
The City of Frederick Maryland

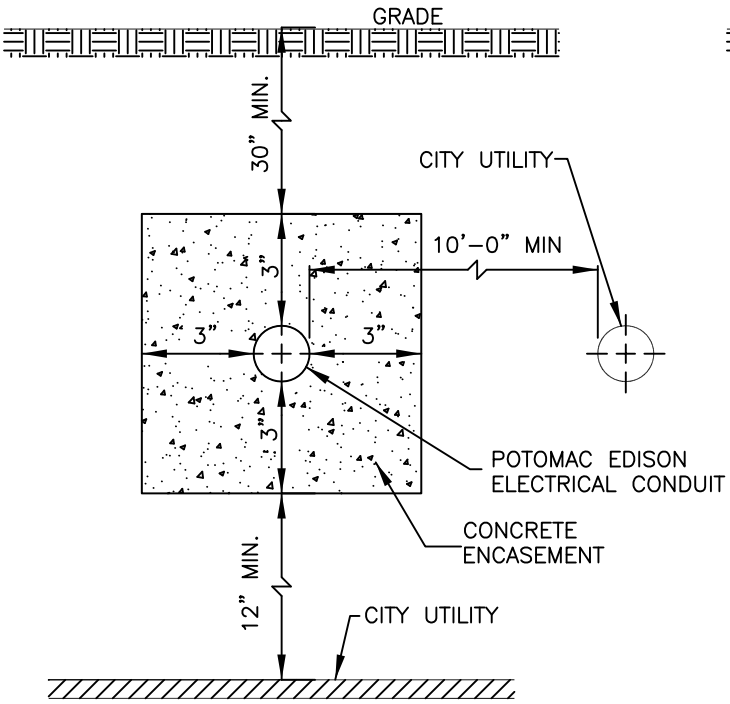
ELECTRICAL JUNCTION BOX

APPROVED: Zachary J. Kershner
DIRECTOR-DEPARTMENT PUBLIC WORKS

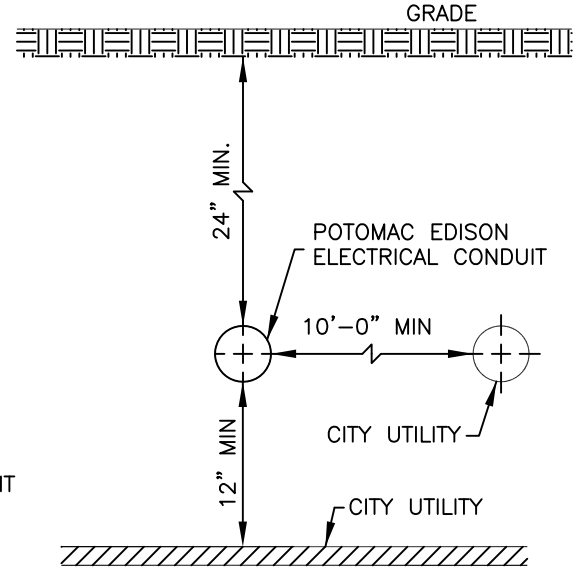
E-4.0

MARCH 2017





PRIMARY SERVICE
NTS



SECONDARY SERVICE
NTS

NOTES:

1. ENCASEMENT AND CONDUITS SHALL RUN FROM PROPERTY LINE TO PROPERTY LINE.
2. THE CITY WILL OBTAIN FROM THE DEVELOPER AN ADDITIONAL SET OF COMPLETE SUBDIVISION AND PUBLIC IMPROVEMENT PLANS AND WILL FORWARD THIS SET TO THE POTOMAC EDISON COMPANY.

The City of Frederick Maryland

POTOMAC EDISON ELECTRICAL CONDUITS IN CITY RIGHT OF WAY

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

E-5.0

LANDSCAPE DETAILS

BOTANICAL NAME	COMMON NAME	DESCRIPTION NOTES	FLOWERS	FRUIT	PLANTING SPACE	SIZE	NOTES
CERCIDIPHYLLUM 'japonicum'	Katsura Tree	Apricot-Orange Fall Color	Dioecious	Small Pods	40 SQ.FT	T	
CERCIS 'canadensis'	Eastern Redbud	A Native Tree	Reddish-Purple	Seed Pods	20 SQ.FT	S	U
CLADRASTIS 'kentukea'	Yellowwood	Excellent Tree for Flowers and Foliage	White	Pinkish-Red Berry	30 SQ.FT	M	
CORNUS 'kousa'	Kousa Dogwood	Relatively Disease Free	White	1/2" Nut	20 SQ.FT	S	U
CORYLUS 'colurna'	Turkish Filbert or Hazel	Tolerant of Adverse Conditions	Male Catkins	Red	40 SQ.FT	M/T	
CRATAEGUS 'crusgalli var. inermis'	Thornless Cockspur	Attractive Flowers, Fruit and Foliage	White	Orange-Red	20 SQ.FT	S	U
CRATAEGUS 'viridis'	Winter King Green Hawthorn	Silver-Gray Fruit and Foliage	White	Seedless	20 SQ.FT	S	
FAGUS 'grandifolia'	American Beech	Full sun best	Monoecious	Threewinged nut	40 SQ.FT	T	
FAGUS 'sylvatica'	European Beech	very attractive	Monoecious	Triangular nut	40 SQ.FT	T	
GINKGO 'biloba'	Maidenhair Tree	Plant males Only Yellow Fall Color	Male	Seedless	40 SQ.FT	T	
GLEDITSIA 'triacanthos'	Imperial Honeylocust	Free of Thorns and Usually Fruitless	Inconspicuous	Fruitless	40 SQ.FT	M	
GLEDITSIA 'triacanthos'	Shademaster Honeycust	Free of Thorns and Usually Fruitless	Inconspicuous	A Few Pods	40 SQ.FT	T	
GLEDITSIA 'triacanthos'	Skyline Honeylocust	Free of Thorns and Usually Fruitless	Inconspicuous	A Few Pods	40 SQ.FT	T	
GYMNOCLADUS 'dioicus'	Kentucky Coffeetree	Plant males Only	Yellow-White Clusters	Seedless	40 SQ.FT	T	
LAGERSTROEMIA 'indica'	Crape Myrtle	Tree Form Only	Showy Clusters	Disk Shaped	20 SQ.FT	S	U
LIQUIDAMBAR 'styraciflua'	Rotundiloba Sweetgum	Deep Reddish Purple Fall Color	Inconspicuous	Seedless	40 SQ.FT	T	
LIRIODENDRON 'tulipifera'	Tulip Tree	Restrict to Large Area	Greenish-Yellow	Samaras	40 SQ.FT	T	
MAGNOLIA 'acuminata'	Cucumbertree	Attractive Form	Greenish-Yellow with Orange	Brgiht Red	40 SQ.FT	T	
MAGNOLIA 'x galaxy'	Galaxy Magnolia	Grows Rapidly	Reddish-Purple to Pink	Follicles	30 SQ.FT	S	U
MAGNOLIA 'stellata'	Star Magnolia	Singles Stem Only Shall be Planted	White	2" Aggregate of Follocles	30 SQ.FT	S	U
MALUS 'snowdrift'	Snowdrift Crabapple	Fruitless Only	White	Fruitless	20 SQ.FT	S	U
MALUS 'spring snow'	Spring Snow Crabapple	Fruitless and Requires Little	White	Fruitless	20 SQ.FT	S	U

LEGEND:
U—ONLY TREE USED FOR UNDER UTILITIES
S—UNDER 30'
M—30' TO 45'
C—COLUMNAR FOR LIMITED SPACE
T—OVER 45'

The City of Frederick Maryland

TREE PLANTING LIST (2)

APPROVED: Zachary J. Kershner
DIRECTOR—DEPARTMENT PUBLIC WORKS

L-1.1

MARCH 2017

METASEQUOIA 'glyptostroboides'	Dawn Redwood	Restrict to Large Area	Inconspicuous	1" Cones	40 SQ.FT	T	
NYSSA 'sylvatica'	Black Gum	Spring Planting Only Red Fall Colors	Greenish-Yellow	Purple Drupe	30 SQ.FT	M	
OSTRYA 'virginiana'	American Hophornbeam	Seldom Has Pest Problems	Light Green Catkins	Small Nutlet	30 SQ.FT	S/M	
PARROTIA 'persica'	Persian Parrotia	Drought tolerant	Red flowers	Brown capsule	30 SQ.FT	M	
PLATANUS 'x acerifolia'	Bloodgood London Plane	Tolerates Urban Conditions	Male	1" Balls	40 SQ.FT	T	
PRUNUS 'sargentii'	Columnar Sargent Cherry	Attractive	Deep Rose	Small black Cherries	20 SQ.FT	M	U
PRUNUS 'virginiana'	Shubert Chokecherry	Colorful Foliage	White 3" to 6" Clusters	Cherries	20 SQ.FT	S	U
PRUNUS 'serrulata'	Flowering Cherry		White to Pink	Fruitless	20 SQ.FT	S	U
QUERCUS 'bicolor'	Swamp White Oak	Tolerates Drought	Inconspicuous	Acorns	40 SQ.FT	T	
QUERCUS 'coccinea'	Scarlet Oak	Less prone to chlorosis	Monoecious	Acorns	40 SQ.FT	T	
QUERCUS 'palustris'	Pin Oak	Chlorosis Problems	Inconspicuous	Acorns	40 SQ.FT	T	
QUERCUS 'phellos'	Willow Oak	Becomes Established Quickly	Inconspicuous	Acorns	40 SQ.FT	T	
QUERCUS 'robur'	English Oak	Tolerates Drought Pollition	Catkins	Acorns	40 SQ.FT	T	
QUERCUS 'rubra'	Red Oak	Wide Lawn or Grass Strips	Inconspicuous	Acorns	40 SQ.FT	T	
QUERCUS 'shumardii'	Shumard Oak	Tolerates Urban Conditions	Inconspicuous	Acorns	40 SQ.FT	T	
STYRAX 'japonicus'	Japanese Snowball Tree	Bell-Shaped	White-Yellowish	Round Drupe	20 SQ.FT	S	U
SOPHAORA 'japonica'	Princton Upright Scholartree	Tolerates Drought Pollition		Pods	40 SQ.FT	T	
STEWARTIA 'pseudocamellia'	Japanese Stewartia	Older bark exfoliates	White petals w/orange anthers	Brown, pointed capsule	20 SQ.FT	S	U
SYRINGA 'reticulata'	Ivory Silk Japanese Lilac Tree	Relatively Pest-Free	Late Spring Creamy-White	Capsules	20 SQ.FT	S	U
SYRINGA 'reticulata'	Regent Japanese Lilac Tree	Attractive Flowers	Pure White	Capsules	20 SQ.FT	S	U
SYRINGA 'reticulata'	Summer Snow Japanese Lilac Tree	Relatively Pest-Free	Late Spring Creamy-White	Capsules	20 SQ.FT	S	U
TAXODIUM 'distichum'	Baldcypress	Relatively Pest-Free	Inconspicuous	Cones	40 SQ.FT	T	C

LEGEND:
U—ONLY TREE USED FOR UNDER UTILITIES
S—UNDER 30'
M—30' TO 45'
C—COLUMNAR FOR LIMITED SPACE
T—OVER 45'

The City of Frederick Maryland

TREE PLANTING LIST (3)

APPROVED: Zachary J. Kershner
DIRECTOR—DEPARTMENT PUBLIC WORKS

L-1.2

MARCH 2017

BOTANICAL NAME	COMMON NAME	DESCRIPTION NOTES	FLOWERS	FRUIT	PLANTING SPACE	SIZE	NOTES
ACER 'buergerianum'	Trident Maple	Slow Growing Small Tree	Greenish-Yellow	Samaras 3/4" to 1"	20 SQ.FT	S	U
ACER 'campestre'	Hedge Maple	Growth Rate Slow To Medium	Small Yellow Green	Double Samaras	30 SQ.FT	M	U
ACER 'ginnala'	Amur Maple	Slow Growing Small Tree	Fragrant Yellowish-White	Samaras 3/4" to 1"	20 SQ.FT	S	U
ACER 'griseum'	Paperbark Maple	Slow Growing Small Tree	Few-Greenish	Samaras 1" to 1-1/2"	20 SQ.FT	S	U
ACER 'rubrum'	Autumn Flame Red Maple	Yellow to Scarlet Early Fall	Pale Red	Fruitless	40 SQ.FT	T	
ACER 'rubrum'	Bowhall Red Maple	Upright Growth Habit	Pale Orange	Samaras	40 SQ.FT	T	
ACER 'rubrum'	Karpick Red Maple	Uniform Rapid Growth	Male	Fruitless	40 SQ.FT	T	
ACER 'rubrum'	October Glory Red Maple	Red Fall Color	Bright Red	Samaras	40 SQ.FT	T	
ACER 'saccharum'	Green Mountain Sugar Maple	Good Filiage Color In Summer and Fall	Yellow-Green	Samras 1"	40 SQ.FT	T	
ACER 'x freemanii'	Armstrong Freeman Maple	Yellow Fall Color	Yellowish-Green	Samaras	40 SQ.FT	T	
AESCULUS 'carnea'	Ruby Red Horsechesnut	Requires Little Pruning	Bright Red	Nearly Fruitless	30 SQ.FT	M	
AESCULUS 'hippicastanum'	Baumann Horsechesnut	Long Lasting Showy Flowers	White	Fruitless	20 SQ.FT	T	
AMELANCHIER 'laevis'	Cumulus Serviceberry	Suitable for Sites with Limited Space	White Blossoms in Spring	Berry-Like Pome	20 SQ.FT	S	U
AMELANCHIER 'laevis'	Majestic Serviceberry	Disease Resistant Foliage	White	Berry-Like Pome	20 SQ.FT	S	U
AMELANCHIER 'x grandiflora'	Autumn Brilliance Serviceberry	Suiteble For Sites with Limited Space	White	Berryless	20 SQ.FT	S	U
AMELANCHIER 'x grandiflora'	Princess Diana Serviceberry	Clean and Disease Resistant Foliage	White	Berries	20 SQ.FT	S	U
AMELANCHIER 'x grandiflora'	Robin Hill Serviceberrry	Suitable for Narrow Sites	Faintly Pink	Small Red to Purple Fruits	20 SQ.FT	S	U
BETULA 'nigra'	Heritage River Birch	Papery Scales Bark	Catkins	Small Nutlet	30 SQ.FT	M	
BETULA 'platyphylla'	White Spire Japanese white Birch	Papery Scales Bark	Catkins	Small Nutlet	30 SQ.FT	M	C
CARPINUS 'caroliniana'	American Hornbeam	Relatively Disease Free	Yellow-Green	Nutlets	30 SQ.FT	S	U/C
CARPINUS 'betulus'	European Hornbeam	Relatively Disease Free	Catkins with Bracts	Nutlets	30 SQ.FT	S	U/C
CELTIS LAEVIGATA 'occidentails'	Magnifica Hackberry	Tolerates Urban Conditions	Inconspicuous	Nearly Sterile	40 SQ.FT	T	

LEGEND:
U—ONLY TREE USED FOR UNDER UTILITIES
S—UNDER 30'
M—30' TO 45'
C—COLUMNAR FOR LIMITED SPACE
T—OVER 45'

The City of Frederick Maryland

TREE PLANTING LIST (1)

APPROVED: _____
DIRECTOR—DEPARTMENT PUBLIC WORKS

L-1.0

MARCH 2017

BOTANICAL NAME	COMMON NAME	DESCRIPTION NOTES	FLOWERS	FRUIT	PLANTING SPACE	SIZE	NOTES
TILIA 'cordata'	Greenspire Littleleaf Linden	Yellow Fall Color	Yellowish	Globose Nutlets	40 SQ.FT	T	
TILIA 'cordata'	Chancellor Littleleaf Linden	Narrow Crown	Yellowish	Globose Nutlets	40 SQ.FT	T	
TILIA 'tomentosa'	Silver Linden	Tolerantes Heat, Drought and Pollution	Yellowish-White	1/3" Nutlet	40 SQ.FT	T	
ULMUS 'americana'	American Elm 'Princeton'	Resistance to Dutch Elm Disease	Inconspicuous	Disc-Shaped	40 SQ.FT	T	
ULMUS 'parvifolia'	Chinese Elm	Resistance to Dutch Elm Disease	Inconspicuous	Disc-Shaped	40 SQ.FT	T	
ULMUS 'wilsoniana'	Wilson's Elm	Resistance to Dutch Elm Disease	Inconspicuous	Disc-Shaped	40 SQ.FT	T	
ULMUS 'hybrids'	Hybrid Elm	Resistance to Dutch Elm Disease	Inconspicuous	Disc-Shaped	40 SQ.FT	T	
ZELKOVA 'serrata'	Green vase Zelkova	A subsitute for American Elm	Inconspicuous	Inconspicuous	40 SQ.FT	T	
ZELKOVA 'serrata'	Halka Zelkova	A subsitute for American Elm	Inconspicuous	Inconspicuous	40 SQ.FT	T	
ZELKOVA 'serrata'	Village green Zelkova	A subsitute for American Elm	Inconspicuous	Inconspicuous	40 SQ.FT	T	

LEGEND:
U–ONLY TREE USED FOR UNDER UTILITIES C–COLUMNAR FOR LIMITED SPACE
S–UNDER 30' M–30' TO 45' T–OVER 45'

NOTES:

1. THE TREES ON THE LATEST EDITION OF THE CITY OF FREDERICK APPROVED PLANTING LIST ARE THE ONLY TREES PERMITTED TO BE PLANTED WITHIN THE CITY OF FREDERICK'S RIGHT–OF–WAYS.
2. ALL PERSONS PLANNING TO PLANT TREES WITHIN THE CITY OF FREDERICK'S RIGHT–OF–WAY SHALL HAVE A PERMIT OBTAINED FROM THE CITY BUILDING DEPARTMENT BEFORE PLANTING BEGINS.
3. ALL STREET TREE PLANTINGS SHALL BE A MINIMUM OF TWO AND HALF (2 1/2) INCH CALIPER AND DISPLAY A SINGLE STRAIGHT TRUNK TO SEVEN (7) FEET OF WHICH FIVE (5) FEET SHALL BE FREE OF BRANCHING (ANZI Z60.1).
4. THERE SHALL BE NO EXCESS SOIL OR MULCH ON TOP OF ROOT BALL SO AS TO EXPOSE BASAL ROOT FLARE.
5. ALL STREET TREE PLANTING SHALL BE FREE OF DAMAGE, DISEASE AND DEFECTS.
6. MINIMUM RECOMMENDATIONS:
   - SHADE OR FLOWERING TREE SIZES 2" TO 2–1/2" CALIPER WITH A SINGLE LEAD AND BRANCHES SHALL BE 50 PERCENT OF TOTAL HEIGHT OF TREE.
7. AVOID ALL CONFLICTS. THERE SHALL BE A MINIMUM TEN (10) FOOT SEPARATION MAINTAINED BETWEEN THE CENTER OF ALL TREES AND ALL PRIVATE AND PUBLIC UTILITY LINES AND UTILITY STRUCTURES (UNDERGROUND AND ABOVE GROUND)
8. ANY QUESTIONS REGARDING TREE PLANTING WITHIN THE CITY OF FREDERICK RIGHT–OF–WAY SHALL BE DIRECTED TO THE DEPUTY DIRECTOR OF PUBLIC WORKS OR HIS/HER DESIGNEE.
9. THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE CITY OF FREDERICK ARBORIST AT 301–600–1233 BEFORE PLACEMENT AND PLANNING OF ANY CITY STREET TREES FOR POSSIBLE FIELD ADJUSTMENT TO LOCATIONS.
10. OF THE TOTAL NUMBER OF REQUIRED TREES TO BE PLANTED ON A PROJECT SITE THERE SHALL BE NO MORE THAN 10% OF ANY ONE TREE SPECIES PLANTED ALONG ANY ONE STREET WITH THE APPROVAL OF THE CITY ARBORIST.

10% RULE	
10%	SPECIES
20%	GENUS
30%	FAMILY

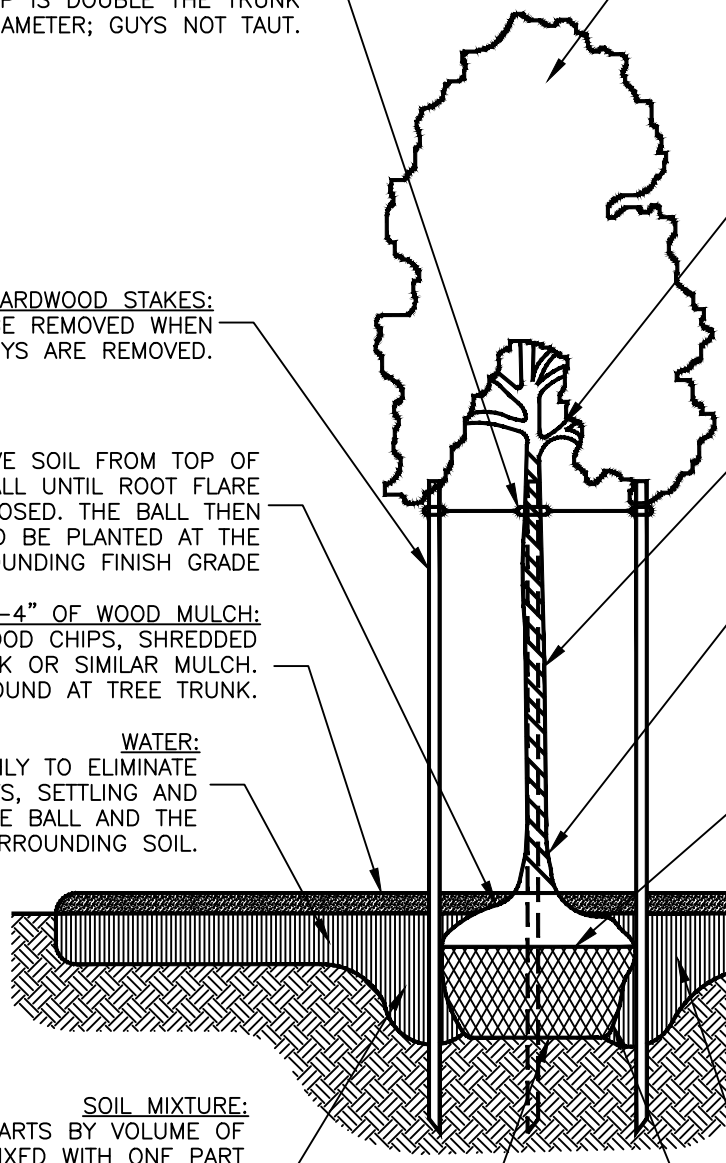
The City of Frederick Maryland

TREE PLANTING LIST (4) AND NOTES

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

L-1.3

MARCH 2017



NOTES:

1. THIS DETAIL DOES NOT REPLACE THE STATE LANDSCAPING DETAILS REFERENCED IN THE CITY SPECIFICATIONS. IT IS ADDITIONAL INFORMATION TO BE USED IN CONJUNCTION WITH THE STATE LANDSCAPING REQUIREMENTS.

2. SPACING BETWEEN THE TREES (CENTER TO CENTER):
   – S: 20–30 FT – M: 30–40 FT –T: 40–50 FT

The City of Frederick Maryland

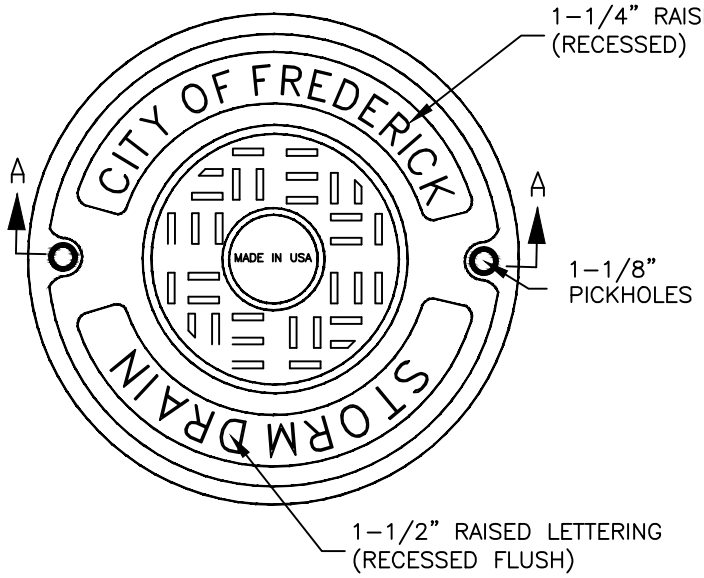
STREET TREE PLANTING

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

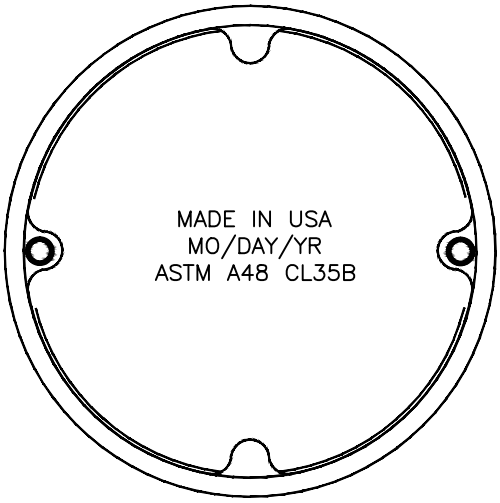
L-2.0

MARCH 2017

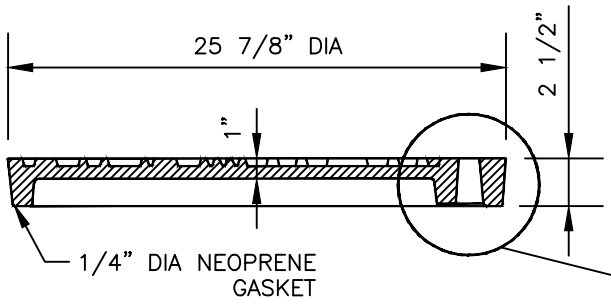
STORM DRAIN DETAILS



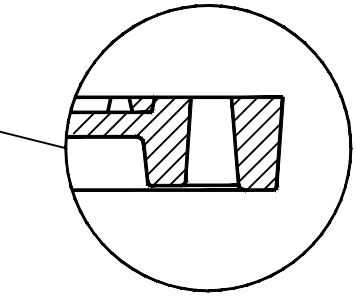
PLAN



BOTTOM VIEW
NTS



COVER SECTION A–A
NTS



OPEN PICKHOLE VIEW
NTS

NOTES:

1. COVER TO BE EAST JORDAN IRON WORKS NO. NCR10–0039A OR APPROVED EQUAL.
2. MATERIAL TO BE CAST IRON ASTM A–48 CLASS 35B.
3. HEAVY DUTY MANHOLE FRAME AND COVER DESIGNED FOR H–20 LOADING: FRAME – 250 PSI. COVER – 170 PSI.

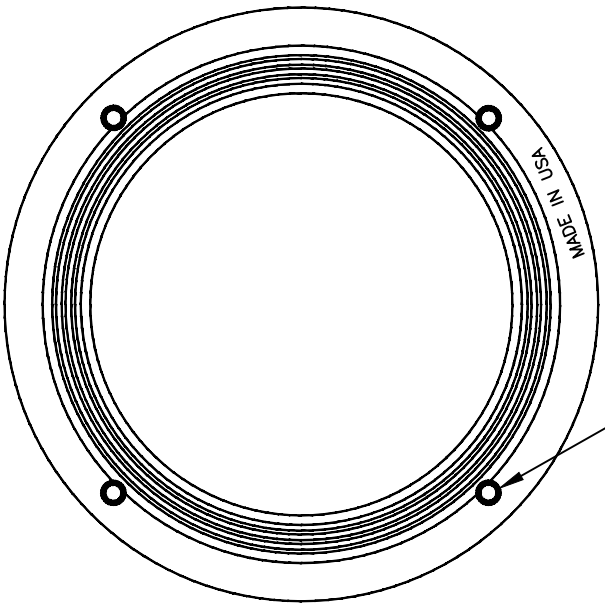
The City of Frederick Maryland

STORM DRAIN MANHOLE COVER

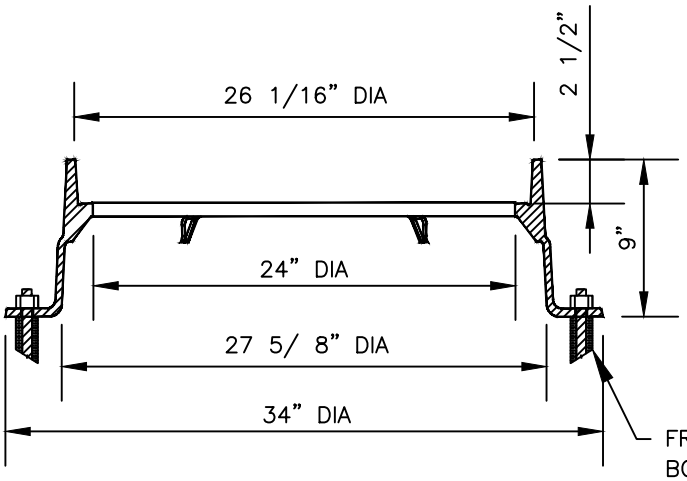
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

SD-1.0

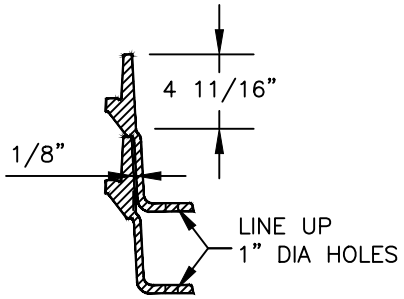
MARCH 2017



PLAN
NTS



SECTION
NTS



STACKING DETAIL
NTS

FRAME AND COVER SHALL BE BOLTED TO STRUCTURE USING $\frac{3}{4}$" GALVANIZED ALL–THREAD W/ ADHESIVE ANCHORING SYSTEM, SIMPSON STRONG TIE AT–XP, OR APPROVED EQUAL

NOTES:

1. FRAME TO BE EAST JORDAN IRON WORKS NO. 00154515 OR APPROVED EQUAL.
2. MATERIAL TO BE CAST IRON ASTM A–48 CLASS 35B.
3. HEAVY DUTY MANHOLE FRAME AND COVER DESIGNED FOR H–20 LOADING: FRAME – 250 PSI. COVER – 170 PSI.
4. FRAME TO BE FURNISHED WITH (4) 1" ø FLANGE HOLES LOCATED 90 DEGREES APART ON A 30–1/4" BOLT CIRCLE.

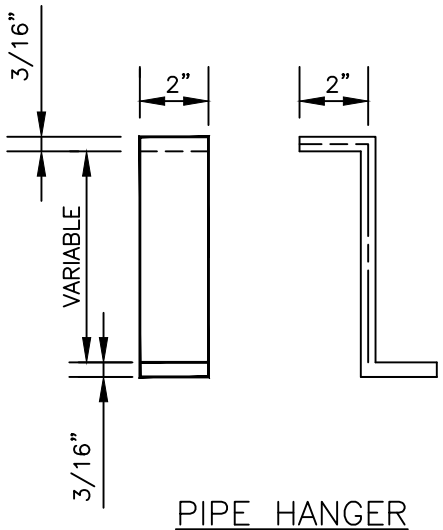
The City of Frederick Maryland

STORM DRAIN MANHOLE FRAME

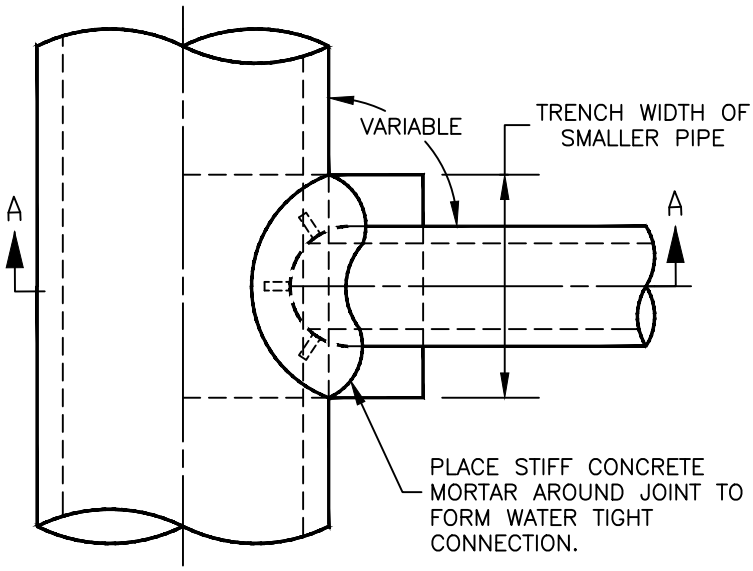
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

SD-1.1

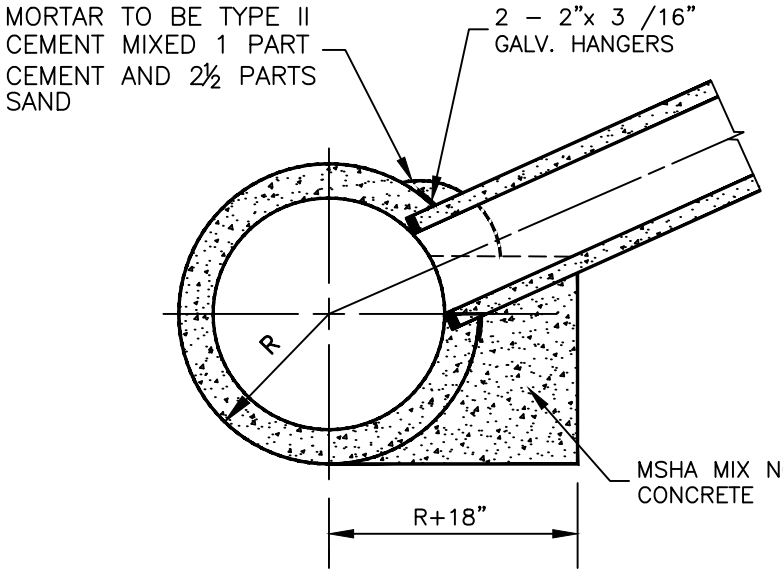
MARCH 2017



PIPE HANGER
NTS



CONNECTION DETAIL
NTS



TRIM END OF SMALLER PIPE FLUSH WITH INSIDE OF LARGER PIPE AND PARGE WITH NON–SHRINK GROUT.

SECTION A–A
NTS

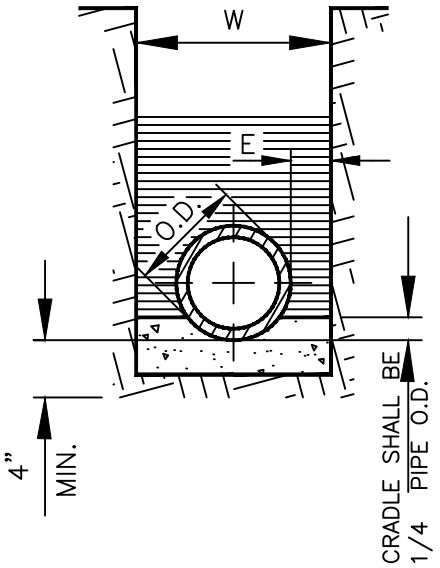
The City of Frederick Maryland

STANDARD FIELD CONNECTION (12" DIA. AND UNDER)

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

SD-2.0

MARCH 2017



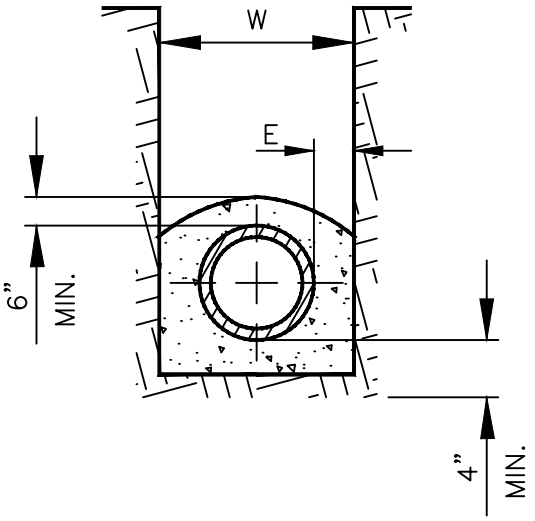
CONCRETE CRADLE
NTS

NOTES:

1. MSHA MIX NO. 3 CONCRETE.

W = MAX. PAYMENT WIDTH = O.D. + 2E(IN.)

E = 9" FOR 6" TO 24" PIPE
E = 12" FOR 27" TO 36" PIPE
E = 15" FOR 42" TO 72" PIPE



CONCRETE ENCASEMENT
NTS

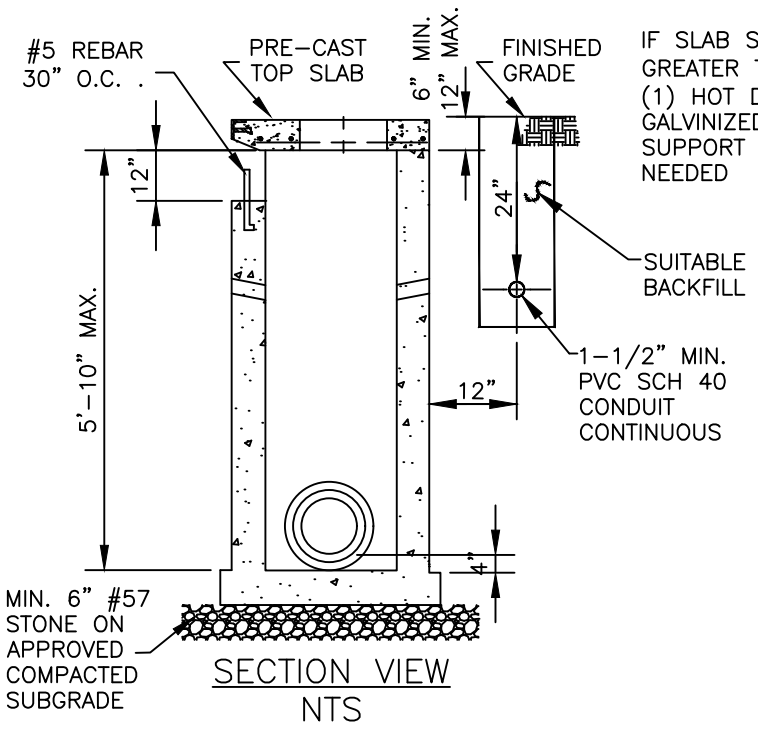
The City of Frederick Maryland

TRENCHES
CRADLE AND ENCASEMENT

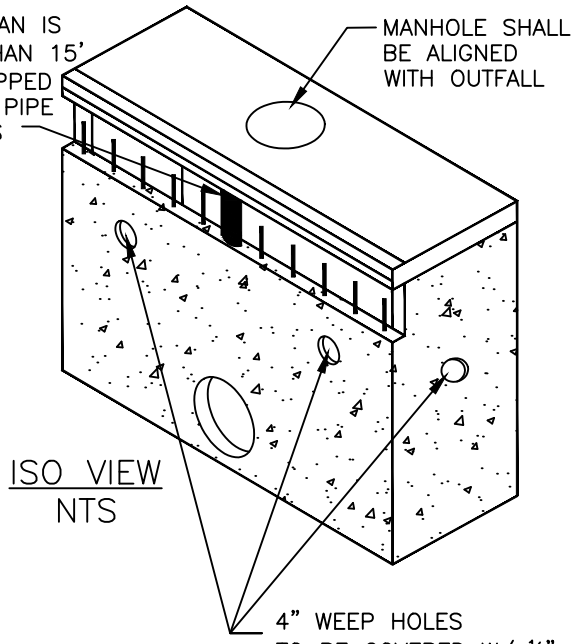
APPROVED: _____
DIRECTOR – DEPARTMENT PUBLIC WORKS

SD-3.0

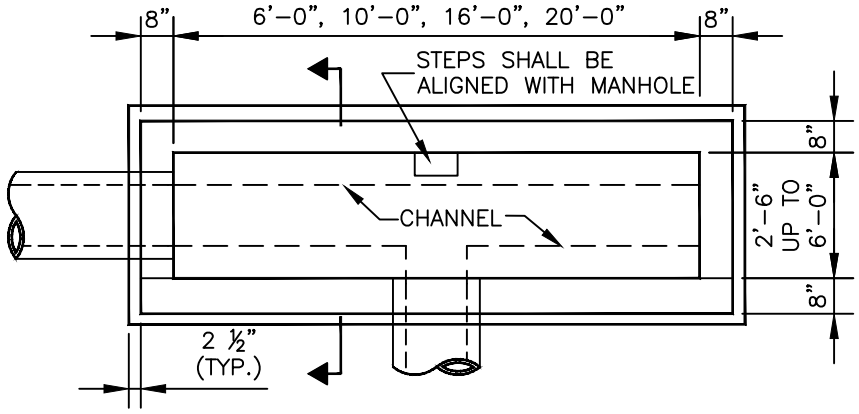
MARCH 2017



SECTION VIEW
NTS



ISO VIEW
NTS



PLAN VIEW
NTS

NOTES:

1. INLET FOR USE WHEN LESS THAN 6' FROM TOP SLAB TO LOW PIPE INVERT.
2. CONCRETE STRENGTH 4500 PSI– MIX NO. 6.
3. TOP SLAB TO BE ADJUSTED TO GRADE IN FIELD AND PRIOR TO CURB PLACEMENT.
4. STEPS TO BE ALIGNED VERTICALLY @ 15" O.C.
5. PIPE OPENINGS TO BE LOCATED AS REQUIRED.
6. JOINT PROVIDED WHEN RISERS ARE REQ. ALL JOINTS TO BE GROUTED W/ NON-SHRINK GROUT INSIDE AND OUT.
7. INVERT CHANNEL TO BE INSTALLED IN FIELD.
8. PIPE SUPPORTS AND GUTTER TO BE SUPPLIED AND INSTALLED.

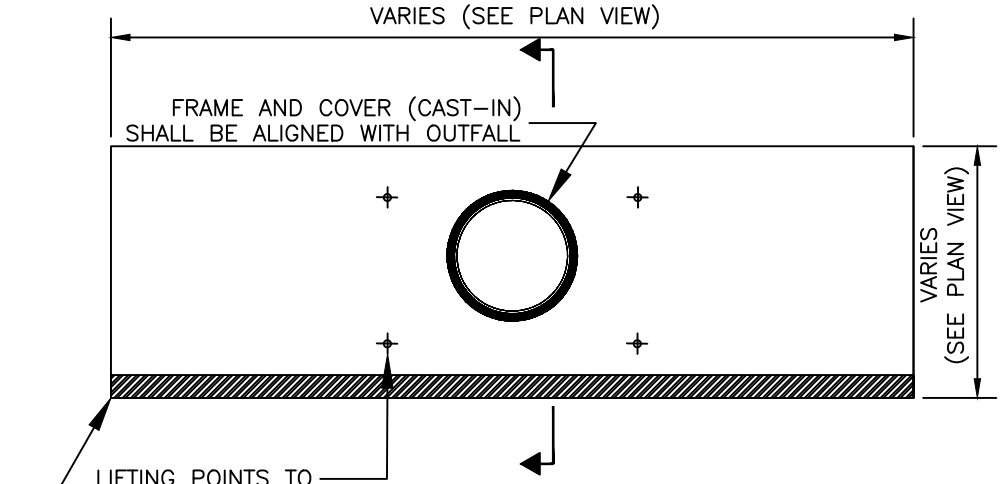
The City of Frederick Maryland

COS/COG INLET-PLAN

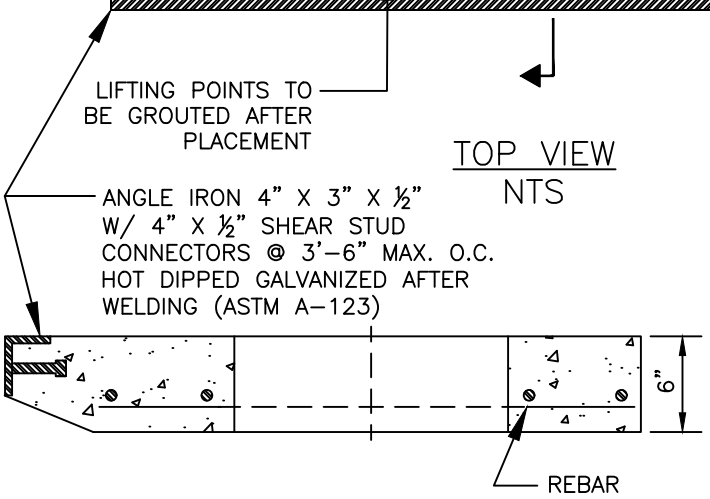
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

SD-4.0

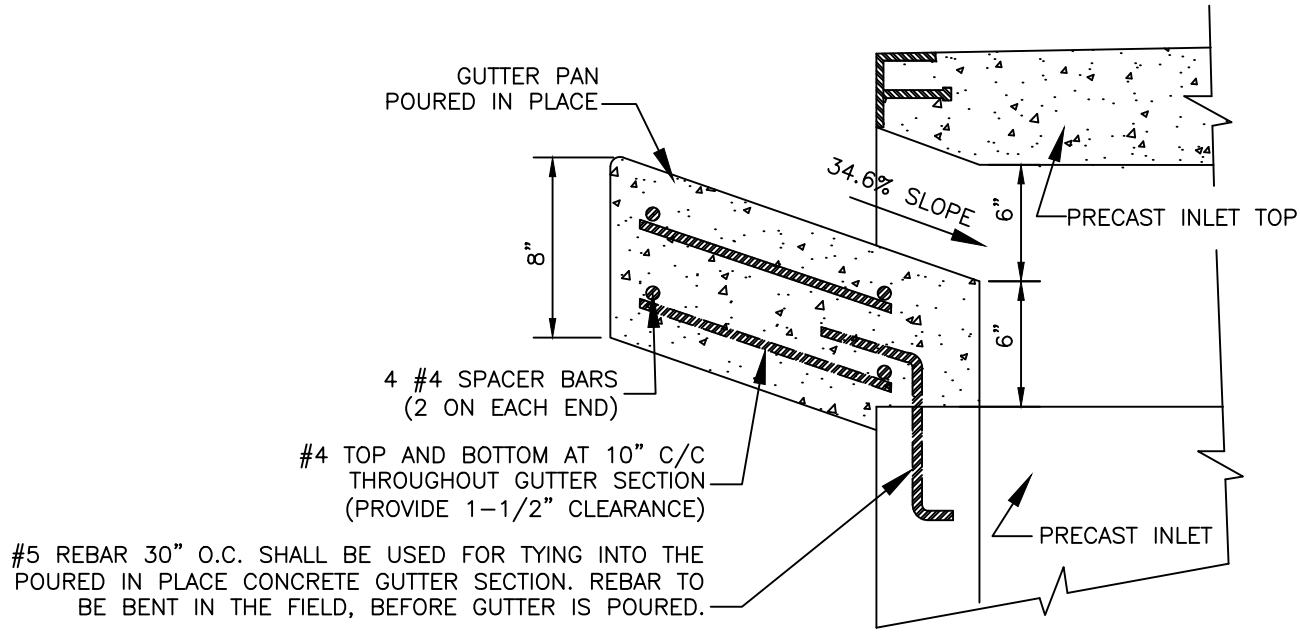
MARCH 2017



TOP VIEW
NTS



SECTION VIEW
NTS



PRECAST THROAT FACING BLOCK
SECTION VIEW
NTS

NOTES:

1. CONCRETE STRENGTH 4500 PSI MIN. MIX NO. 6
2. ASTM A–615 GRADE 60 STEEL.

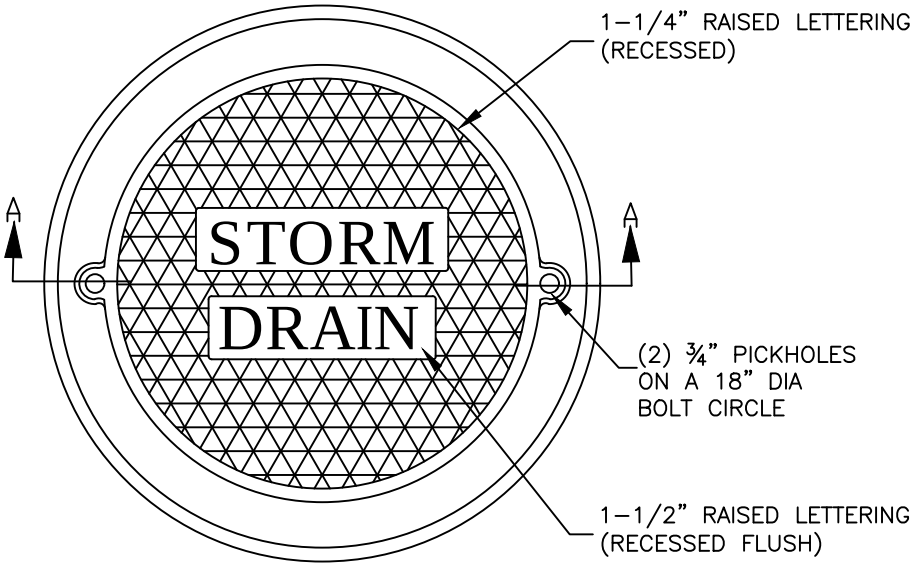
The City of Frederick Maryland

COS/COG INLET
PRECAST TOP SLAB AND FACING BLOCK

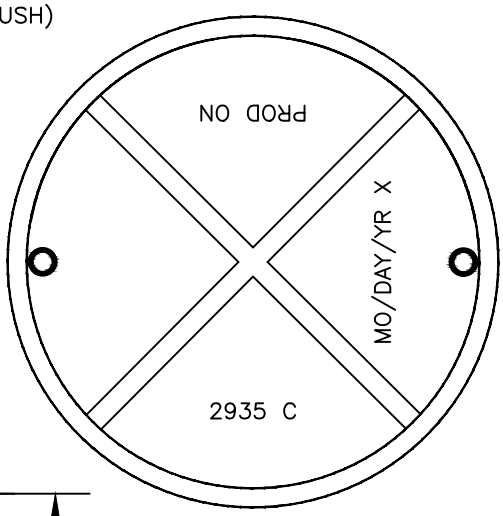
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

SD-4.1

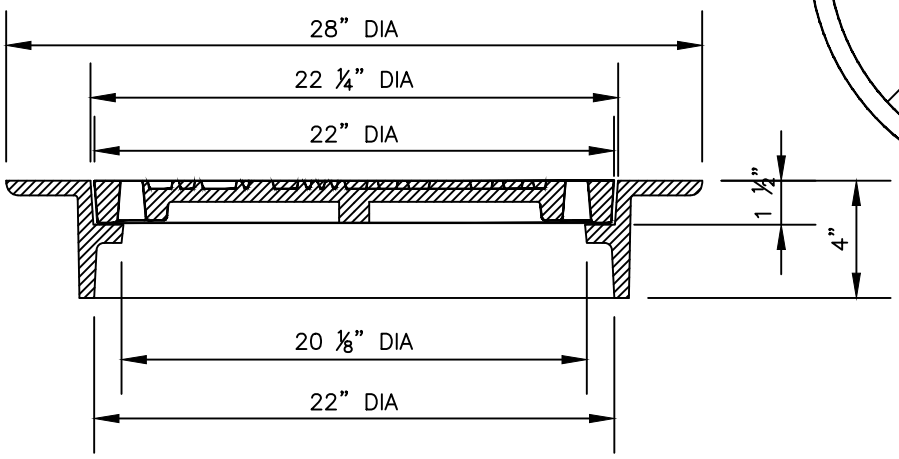
MARCH 2017



PLAN
NTS



BOTTOM
NTS



SECTION A–A
NTS

NOTES:

1. FRAME TO BE EAST JORDAN IRON WORKS NO. 2935Z OR APPROVED EQUAL.
2. COVER TO BE EAST JORDAN IRON WORKS NO. 2935C OR APPROVED EQUAL.
3. MATERIAL TO BE CAST IRON ASTM A–48 CLASS 35B.

The City of Frederick Maryland

COS/COG INLET FRAME AND COVER

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

SD-4.2

MARCH 2017

NOTES:

1. CHANNEL TO BE HOT DIPPED GALVANIZED STEEL.
2. REINFORCING STEEL SHALL HAVE MINIMUM 2" COVER, UNLESS NOTED.
3. FOR PIPES 30" AND LARGER, PROVIDE STEPS IN CHANNELS OF STRUCTURES.
4. ON TERMINAL INLETS, THE INLET BOTTOM SHALL BE SLOPED TO OUTLET PIPE WITH CONCRETE MINIMUM 2% SLOPE TOWARDS OUTLET.
5. FOR ACTUAL PIPE LOCATIONS, REFER TO STORM DRAIN PLANS AND CONSTRUCT BRICK OR CONCRETE CHANNEL TO PIPE CONFIGURATIONS. BRICK CHANNEL SHALL BE SEWER BRICK ON EDGE AND BUILT TO THE HALFWAY POINT OF THE PIPES.
6. PRECAST COS/COG INLET STRUCTURES WITH ROUND BASES & RECTANGLE TOP SECTIONS ARE ONLY PERMISSIBLE PROVIDED THEY MEET ALL MSHA REQUIREMENTS EXCEPT THAT THEY SHALL HAVE 4" WEEP HOLES CAST BELOW THE TOP SLAB IN LINE WITH AND BELOW THE BOTTOM OF THE CURB ON EACH SIDE. AND PROVIDED 6' OR GREATER FROM TOP TO LOW PIPE INVERT.
7. ADJUST INLET TOPS WITH SEWER BRICK OR APPROVED MATERIAL. MAX. OF 4 BRICK OR FORMED CONCRETE IF GREATER THAN 4 BRICK.
8. A INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C-913.
9. CONCRETE MIX DESIGN PER MD STD. MIX 6. CONCRETE TO BE 4,500 PSI AT 28DAYS MIN, TYPE II PORTLAND CEMENT.
10. REINFORCING DEFORMED BARS SHALL BE ASTM A-615, GR. 60, AND WETLAND WIRE FABRIC REINFORCING IN ACCORDANCE WITH ASTM A185 & A82 GRATE 65.
11. LADDER RUNGS INSTALLED IN VERTICAL ALIGNMENT DESIGNED TO PREVENT LATERAL SLIPPAGE, 1'-0" C/C MAX.
12. LIFT HOLES OR LIFT EYES PROVIDED IN EACH SECTION FOR HANDLING, AND THEY ARE TO BE FILLED WITH AN APPROVED NON-SHRINK GROUT OR CONCRETE BY CONTRACTOR AS SPECIFIED OR APPLICABLE.
13. TRIM ALL OPENINGS IN BASE, WALLS, AND TOP OF SLAB, WITH #4 DEFORMED BAR, UNLESS NOTED.
14. ANNULAR SPACE BETWEEN PIPE AND HOLE TO BE FILLED WITH AN APPROVED CONCRETE OR PROPERLY LAID SEWER BRICK WITH SOLID MASONRY JOINTS.
15. PROVIDE BENT CONTINUOUS WELDED WIRE MESH OR BAR AT WALL CORNERS TO PROVIDE CONTINUOUS HORIZONTAL REINFORCING, BAR LAPS 12 INCHES MINIMUM.
16. STEEL FACING ANGLE TO BE HOT DIPPED GALVANIZED AFTER WELDING, SHEAR STUDS CONNECTIONS TO FACING ANGLE TO BE WELDED, WELD TO BE ¼" FILLET ALL AROUND.
17. IF TOP SLAB IS 15' OR GREATER PIPE SUPPORT IS TO BE INSTALLED BY CONTRACTOR MADE FROM 3" DIA. HOT DIPPED GALVANIZED STEEL PIPE 12" LONG PIPE TO HAVE FLANGED ENDS AND BE FILLED WITH CONCRETE BOTTOM FLANGE OF PIPE SUPPORT TO BE CAST INTO CURB AND GUTTER TOP SLAB TO REST ON TOP FLANGE OF PIPE SUPPORT. PIPE SUPPORT IS NOT NEEDED IF SLAB IS H-20 RATED.
18. ALL STRUCTURES TO USE SHA AND/OR CITY SPECIFICATION.

The City of Frederick Maryland

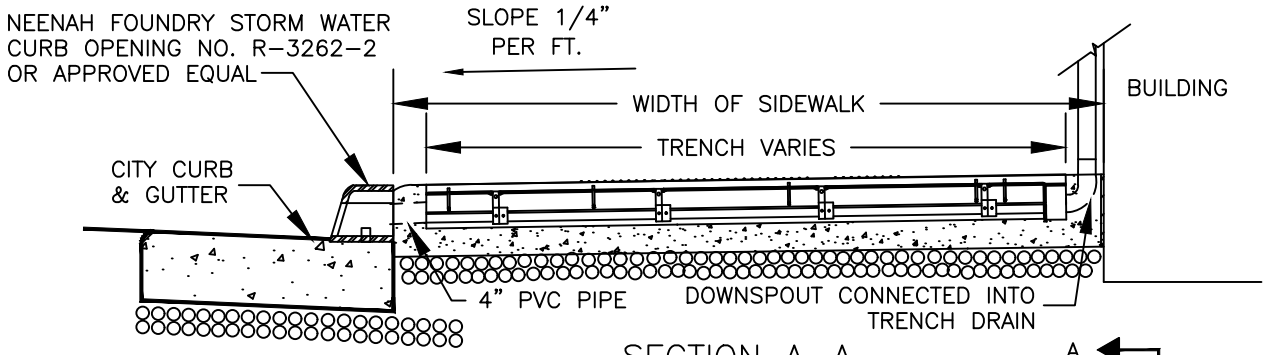
COS/COG INLET- GENERAL NOTES

APPROVED: Zachary J. Kearbey

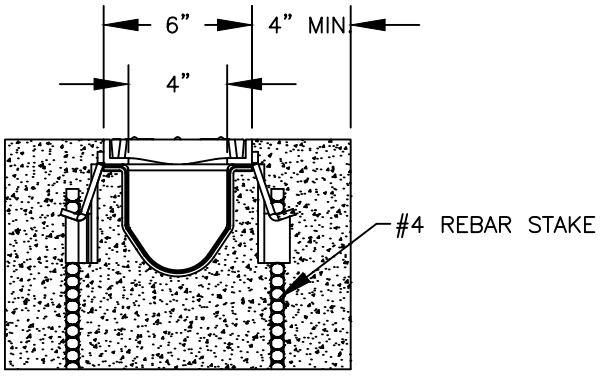
DIRECTOR-DEPARTMENT PUBLIC WORKS

SD-4.3

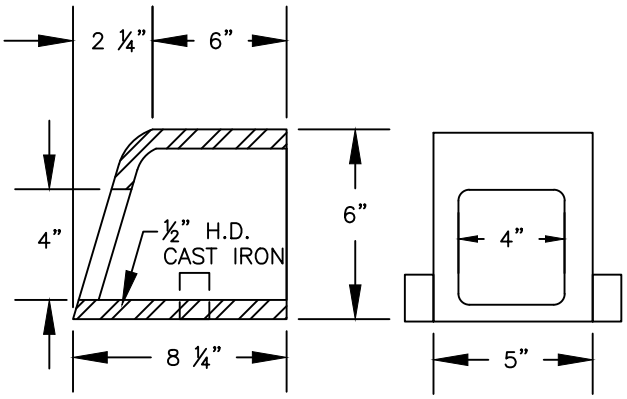
MARCH 2017



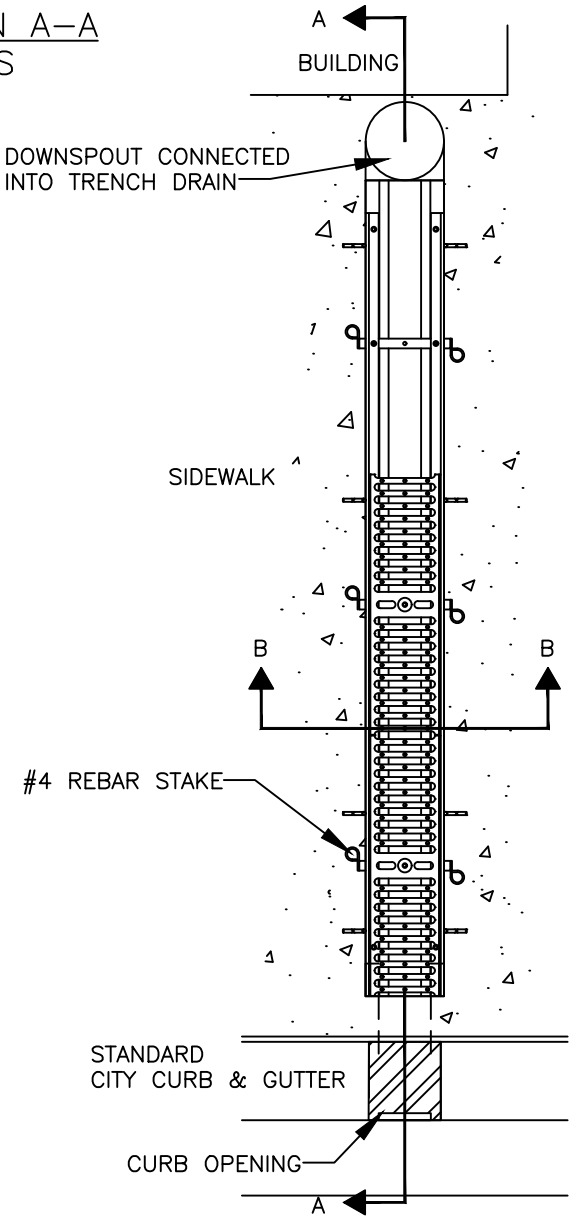
SECTION A–A
NTS



SECTION B–B
NTS



CURB OPENING DETAIL
NTS



TOP VIEW
NTS

NOTES:

1. CONTACT THE CITY OF FREDERICK INSPECTOR PRIOR TO INSTALLATION
2. MINIMUM OF 5' OF CURB AND GUTTER MUST BE REMOVED ON BOTH SIDES OF CURB OPENING WHEN INSTALLING IN EXISTING CURB AND GUTTER

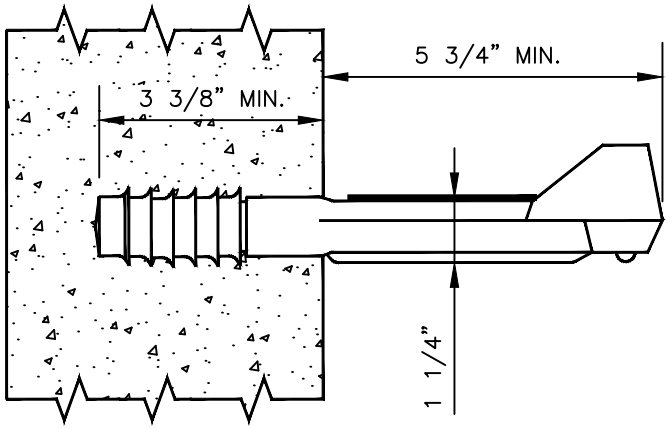
The City of Frederick Maryland

SIDEWALK TRENCH DRAIN

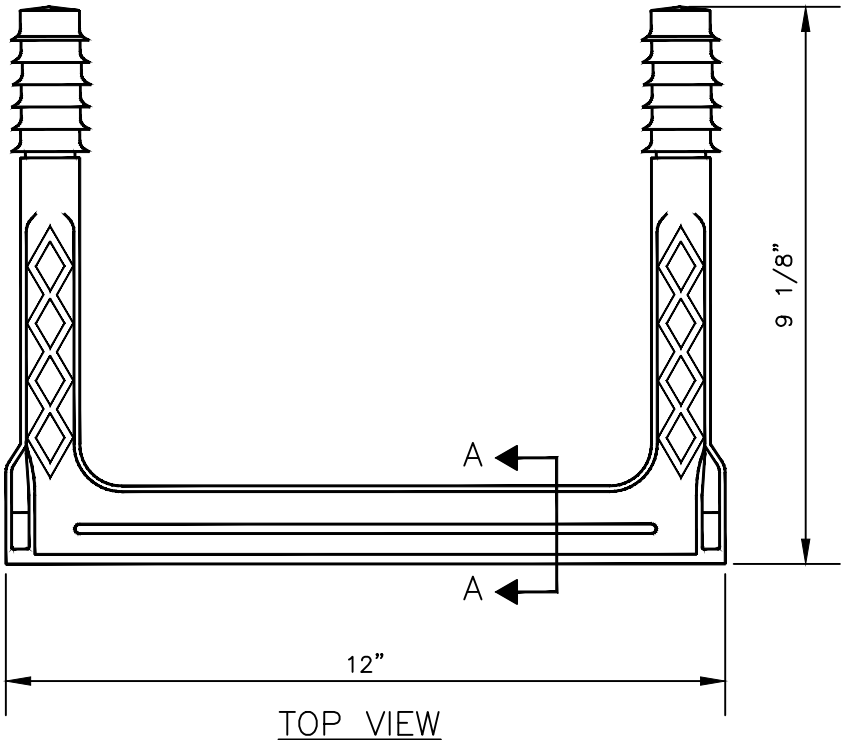
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

SD-5.0

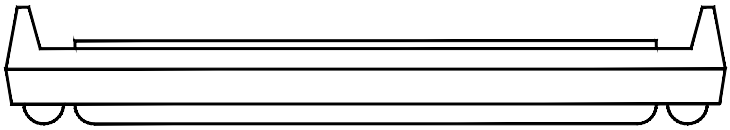
MARCH 2017



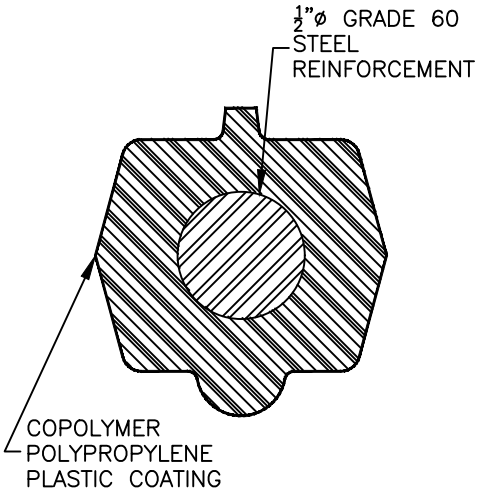
SIDE VIEW
NTS



TOP VIEW
NTS



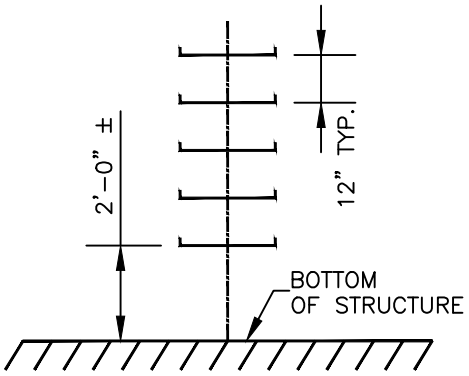
FRONT VIEW
NTS



SECTION A–A
NTS

NOTES:

COPOLYMER POLYPROPYLENE COATING SHALL BE CERTIFIED BY THE MANUFACTURER TO CONFORM TO ASTM D4101 AND HAVE A MINIMUM EXPOSED SECTION THICKNESS OF 1/8"



TYPICAL LADDER STEP LOCATION
NTS

The City of Frederick Maryland

MANHOLE STEPS

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

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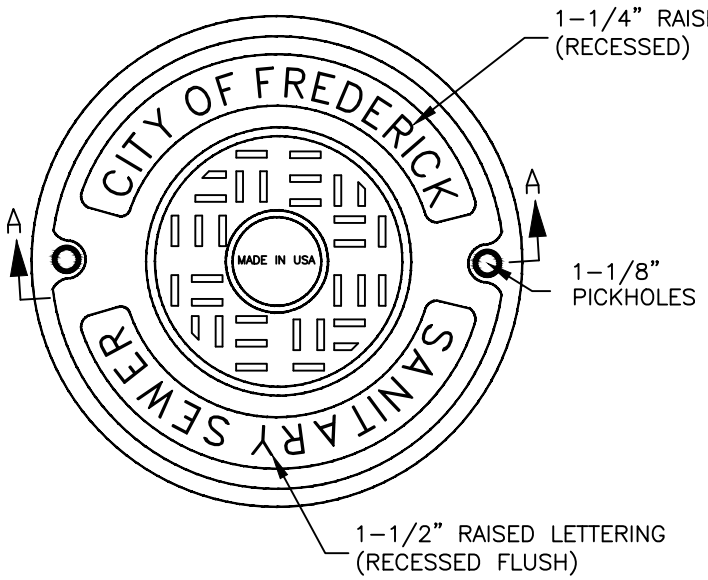
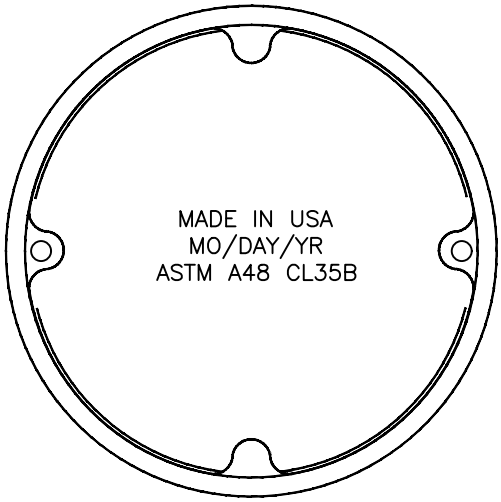
MARCH 2017

SEWER DETAILS

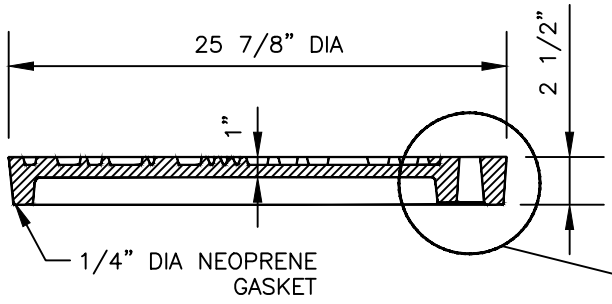
SEWER DETAILS



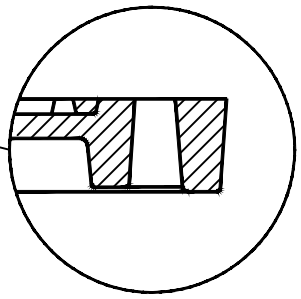
PLAN
NTS



BOTTOM VIEW
NTS



COVER SECTION
NTS



OPEN PICKHOLE VIEW
NTS

NOTES:

1. FRAME AND COVER TO BE EAST JORDAN IRON WORKS NO. NCR10–0039A OR APPROVED EQUAL.
2. MATERIAL TO BE CAST IRON ASTM A–48 CLASS 35B.
4. HEAVY DUTY MANHOLE FRAME AND COVER DESIGNED FOR H–20 LOADING: FRAME– 250 PSI. COVER– 170 PSI.
5. FRAME TO BE FURNISHED WITH (4) 1" ø FLANGE HOLES LOCATED 90 DEGREES APART ON A 30–1/4" BOLT CIRCLE. SEE S–1.2

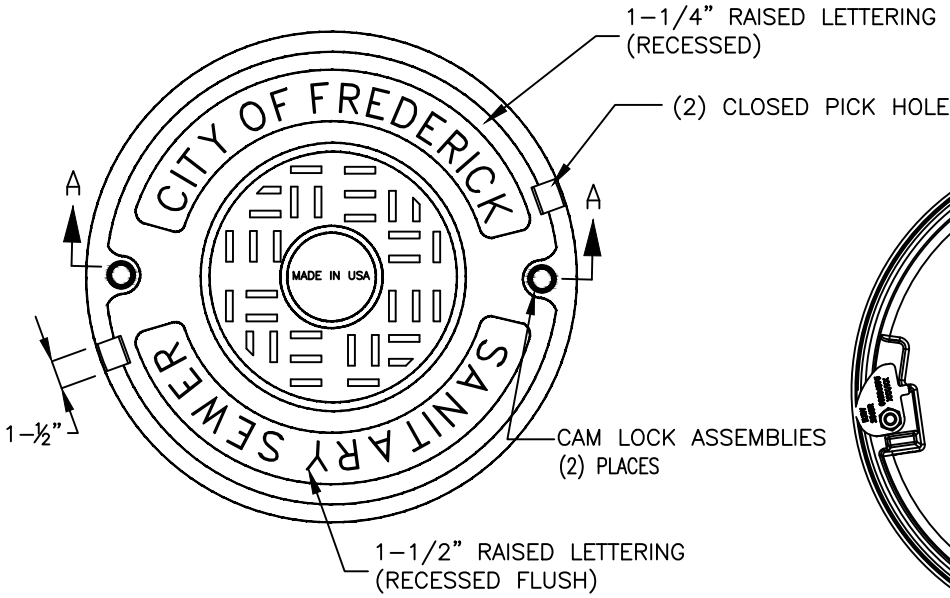
The City of Frederick Maryland

SANITARY SEWER MANHOLE COVER

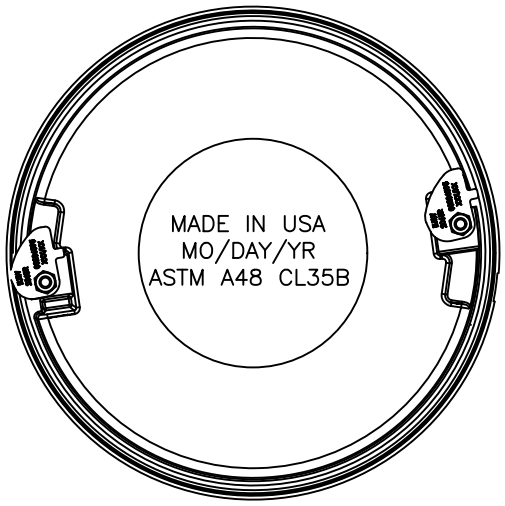
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-1.0

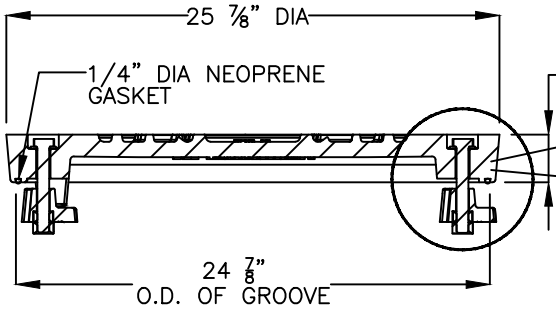
MARCH 2017



PLAN
NTS

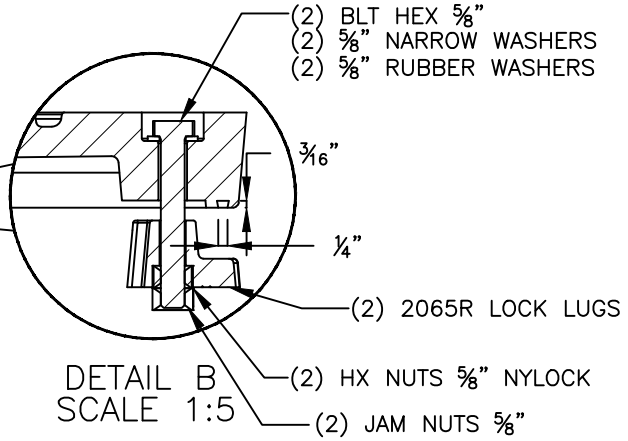


BOTTOM VIEW
NTS



SECTION A–A

COVER SECTION
NTS



DETAIL B
SCALE 1:5

CAM LOCK VIEW
NTS

NOTES:

1. FRAME AND COVER TO BE WATER TIGHT, WITH THE ADDITION OF A WATER TIGHT SEAL, EAST JORDAN IRON WORKS NO. NCR10–0039A OR APPROVED EQUAL.
2. A WATER TIGHT MANHOLE IS REQUIRED IN LOW WATER AREAS, SUCH AS FLOODPLAIN AND/OR STREAM BUFFERS.
3. MATERIAL TO BE CAST IRON ASTM A–48 CLASS 35B.
4. HEAVY DUTY MANHOLE FRAME AND COVER DESIGNED FOR H–20 LOADING: FRAME– 250 PSI. COVER– 170 PSI.
5. FRAME TO BE FURNISHED WITH (4) 1" ø FLANGE HOLES LOCATED 90 DEGREES APART ON A 30–1/4" BOLT CIRCLE. SEE S–1.2
6. FRAME AND COVER ADJUSTMENT TO BE MADE USING EAST JORDAN ADJUSTABLE MANHOLE RISER SYSTEM PRODUCT NO. M7 OR M2 MARYLAND SPEC OR APPROVED EQUAL.

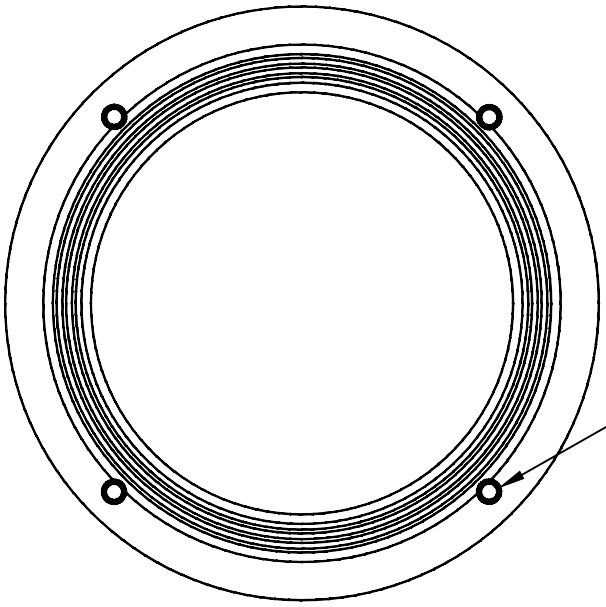
The City of Frederick Maryland

WATER TIGHT SANITARY SEWER MANHOLE COVER

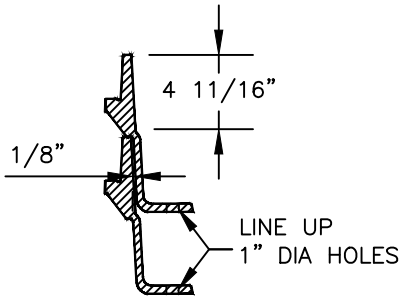
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-1.1

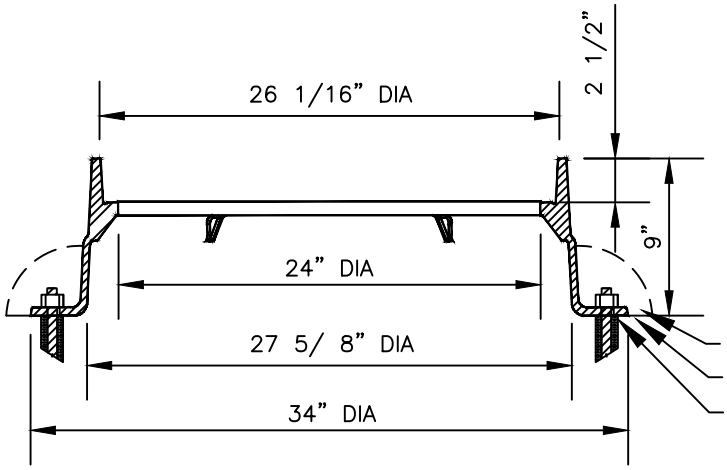
MARCH 2017



PLAN
NTS



STACKING DETAIL
NTS



SECTION
NTS

GROUT AND TAR

FLEXABLE GASKET BETWEEN FRAME AND STRUCTURE

FRAME AND COVER SHALL BE BOLTED TO STRUCTURE USING ¾" GALVANIZED ALL–THREAD W/ ADHESIVE ANCHORING SYSTEM, SIMPSON STRONG TIE AT–XP, OR APPROVED EQUAL

NOTES:

1. FRAME AND COVER TO BE EAST JORDAN IRON WORKS NO. 00154515 OR APPROVED EQUAL.
2. MATERIAL TO BE CAST IRON ASTM A–48 CLASS 35B.
3. FLEXIBLE PLASTIC GASKET BETWEEN MANHOLE AND MANHOLE FRAME SHALL BE EXTRUDED ROPE TYPE 'B' IN ACCORDANCE WITH AASHTO M–198, BUTYLE BASED, 3/4 INCH DIAMETER MIN. AND SHALL CONFORM TO ASTM C–443/C–361 FOR RUBBER TYPE GASKET JOINTS OR NEOPRENE ASTM D1056.
4. HEAVY DUTY MANHOLE FRAME AND COVER DESIGNED FOR H–20 LOADING: FRAME– 250 PSI. COVER– 170 PSI.
5. FRAME TO BE FURNISHED WITH (4) 1" ø FLANGE HOLES LOCATED 90 DEGREES APART ON A 30–1/4" BOLT CIRCLE.
6. FRAME AND COVER ADJUSTMENT TO BE MADE USING EAST JORDAN ADJUSTABLE MANHOLE RISER SYSTEM PRODUCT NO. M7 OR M2 MARYLAND SPEC OR APPROVED EQUAL.

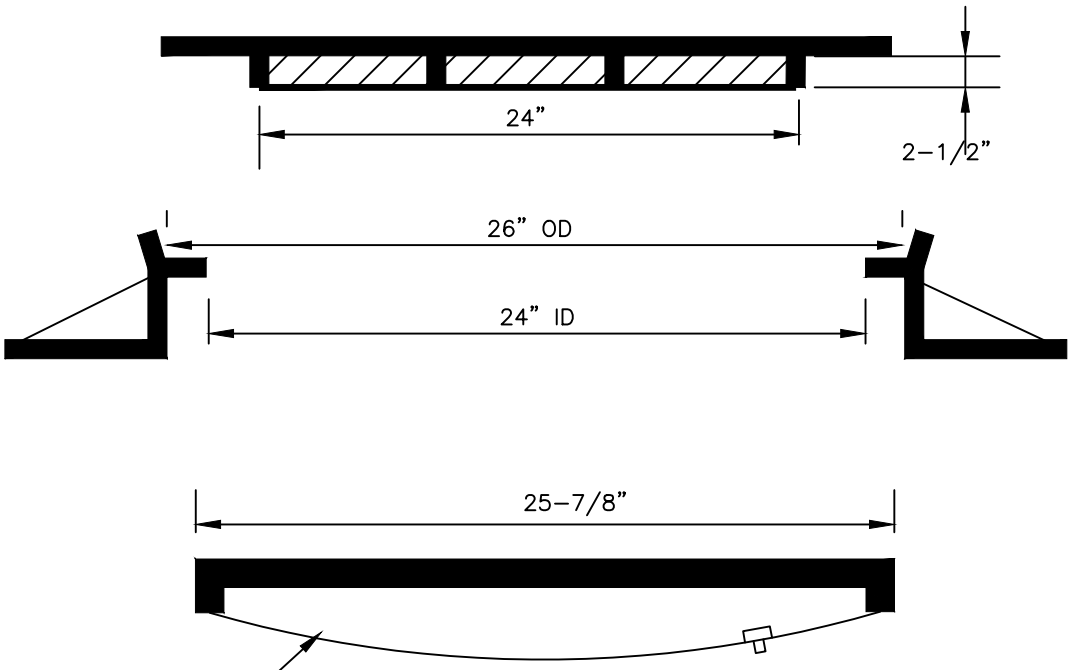
The City of Frederick Maryland

SANITARY SEWER MANHOLE FRAME

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-1.2

MARCH 2017



STYLE "A" NO FLOW INFLOW MANHOLE COVER OR APPROVED EQUAL. COVER TYPICAL FOR 24"MH. REFER TO MANUFACTURER FOR ADDITIONAL SIZES.

INFLOW PROTECTION SIDE–VIEW
NTS

NOTES:

1. THE MANHOLE INFLOW PROTECTION DISH SHALL BE "NO FLOW INFLOW SEAL" OR APPROVED EQUAL.
2. THE MANHOLE FRAME SHALL BE CLEANED OF ALL DIRT AND DEBRIS BEFORE PLACING THE MANHOLE INSERT ON THE RIM.
3. THE MANHOLE INSERT SHALL BE FULLY SEATED AROUND THE MANHOLE FRAME RIM TO PREVENT WATER FROM INFILTRATING BETWEEN THE COVER AND THE MANHOLE FRAME RIM.
4. ALL INSERTS SHALL HAVE A LIFT HANDLE AND VALVE WITHOUT A RUBBER GASKET, SO NOT TO RAISE MANHOLE COVER.

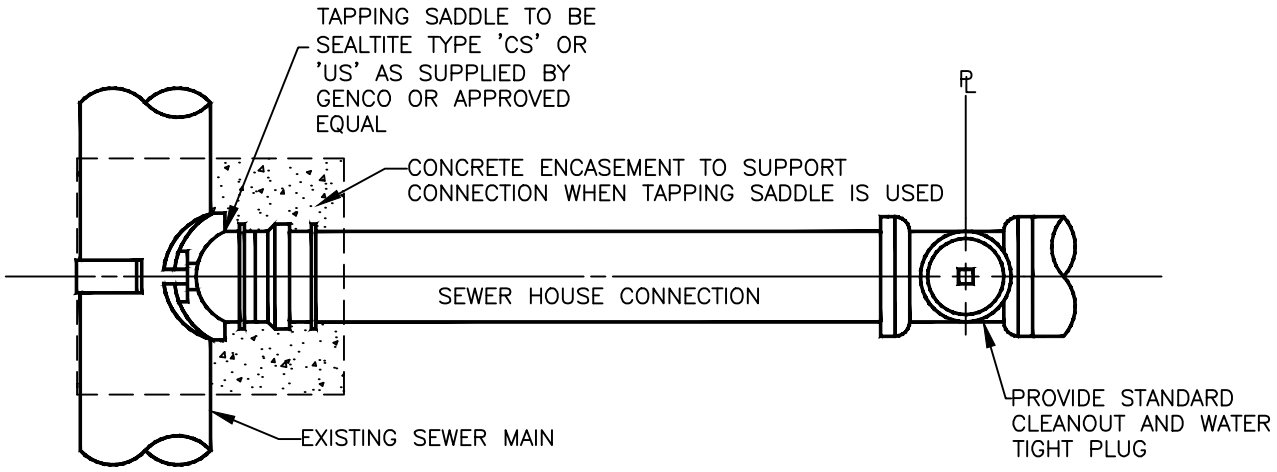
The City of Frederick Maryland

MANHOLE INFLOW PROTECTION DISH

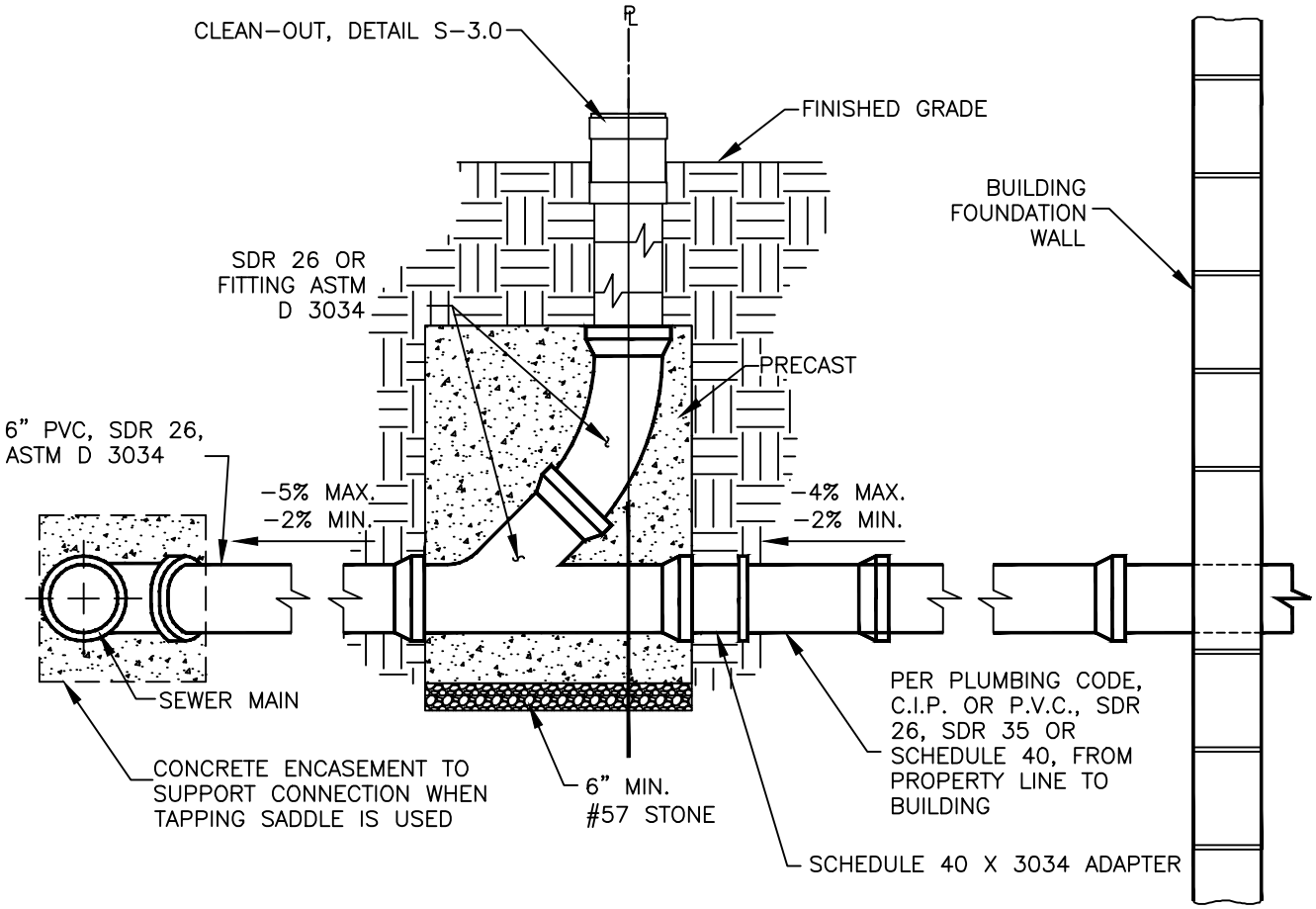
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-1.3

MARCH 2017



HOUSE CONNECTION FITTINGS
NTS



SEWER HOUSE CONNECTION
NTS

NOTE:

1. NO MAIN LINE CROSS CONNECTIONS ALLOWED
2. PER PLUMBING CODE, ADDITIONAL CLEANOUT PLUG TO BE LOCATED IN OR AT BUILDING.
3. PRECAST CONCRETE SHALL BE SHA MIX NO. 6. 4000PSI

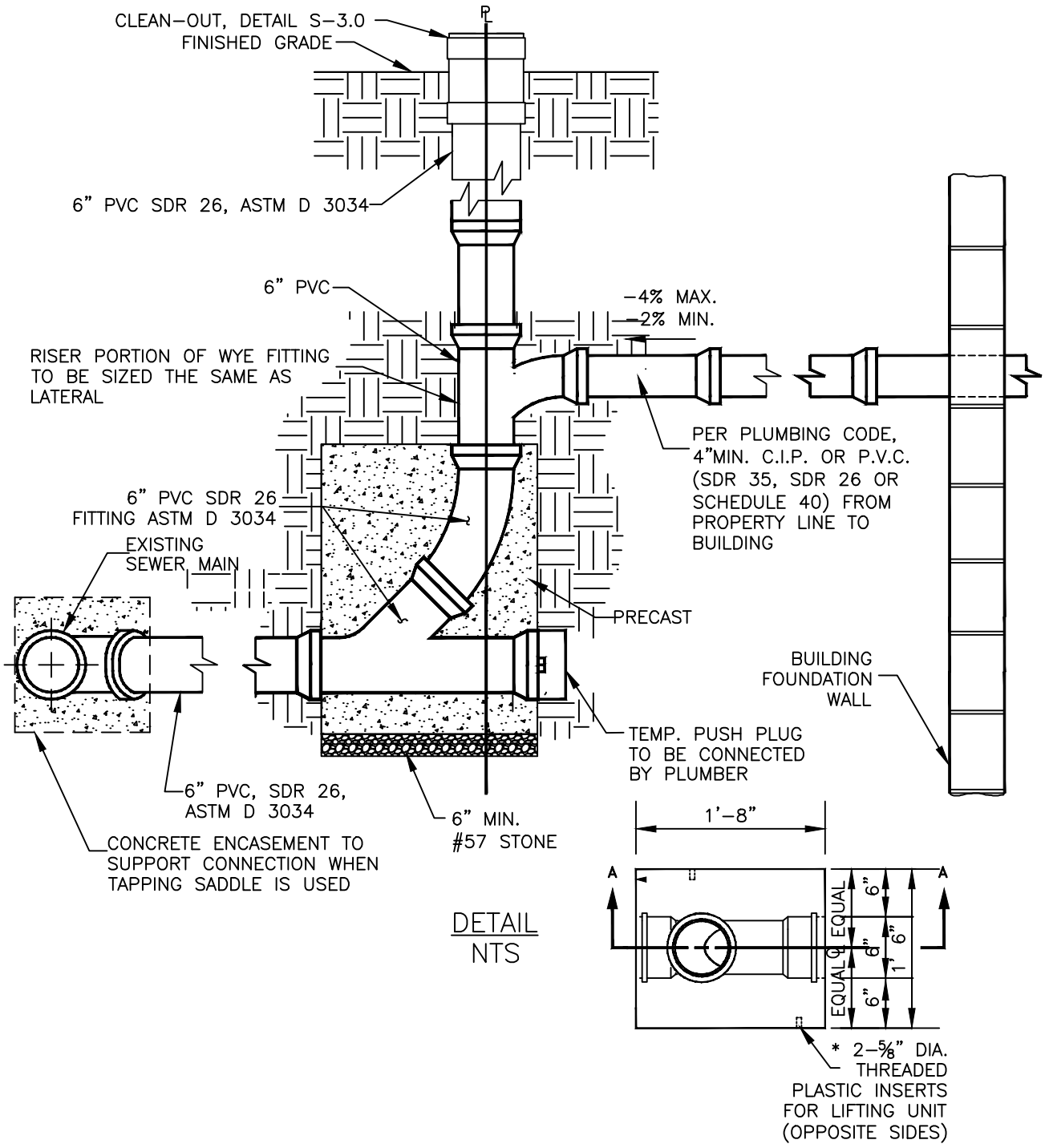
The City of Frederick Maryland

SEWER HOUSE CONNECTION

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-2.0

MARCH 2017



NOTE:

1. NO MAIN LINE CROSS CONNECTIONS ALLOWED
2. PRECAST SHALL BE 4000 PSI CONCRETE
3. PRECAST TO HAVE 2–POINTS FOR LIFTING= ⅝" DIAMETER INSERTS
4. ALL PIPE HUBS AT FACE OF CONCRETE ARE 4" OR 6" PVC SDR–26 GASKET
5. PER PLUMBING CODE, ADDITIONAL CLEANOUT PLUG TO BE LOCATED IN OR AT BUILDING.

The City of Frederick Maryland

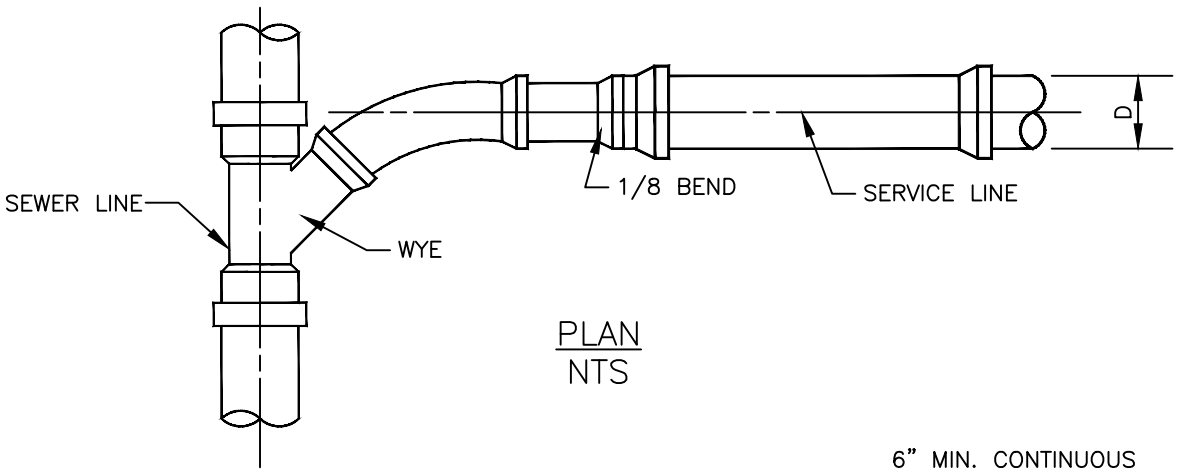
SEWER DROP HOUSE CONNECTION

APPROVED: Zachary J. Kershner

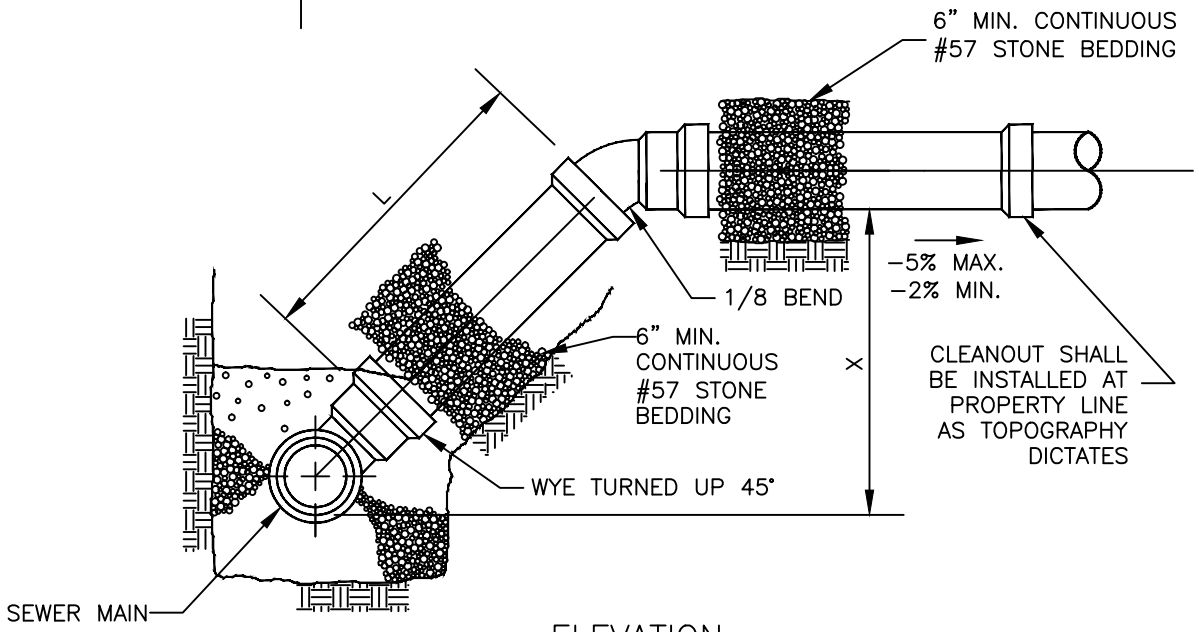
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-2.1

MARCH 2017



PLAN
NTS



ELEVATION
NTS

NOTES:

1. NO MAIN LINE CROSS CONNECTIONS ALLOWED
2. APPROVAL FROM ENGINEERING DEPARTMENT REQUIRED PRIOR TO USE OF THIS DETAIL.
3. ALL PIPE, FITTINGS AND JOINTS SHALL BE OF THE QUALITY AND CONSTRUCTION AS STATED IN THE APPROVED MATERIALS LIST.
4. THE "X" AND "L" DIMENSIONS SHALL BE DETERMINED IN THE FIELD TO MEET THE CLEANOUT ELEVATION REQUIRED ON CONTRACT DRAWING,

WHERE: $L = \sqrt{2}\,(X - D/24) - 0.75$
X=DIFFERENCE IN ELEVATION BETWEEN THE INVERT OF THE SERVICE AT THE MAIN AND THE INVERT OF THE 1/8 BEND (IN FEET.)

L=LENGTH OF PIPE (IN FEET.)
D=DIAMETER OF SEWER SERVICE (IN INCHES.)

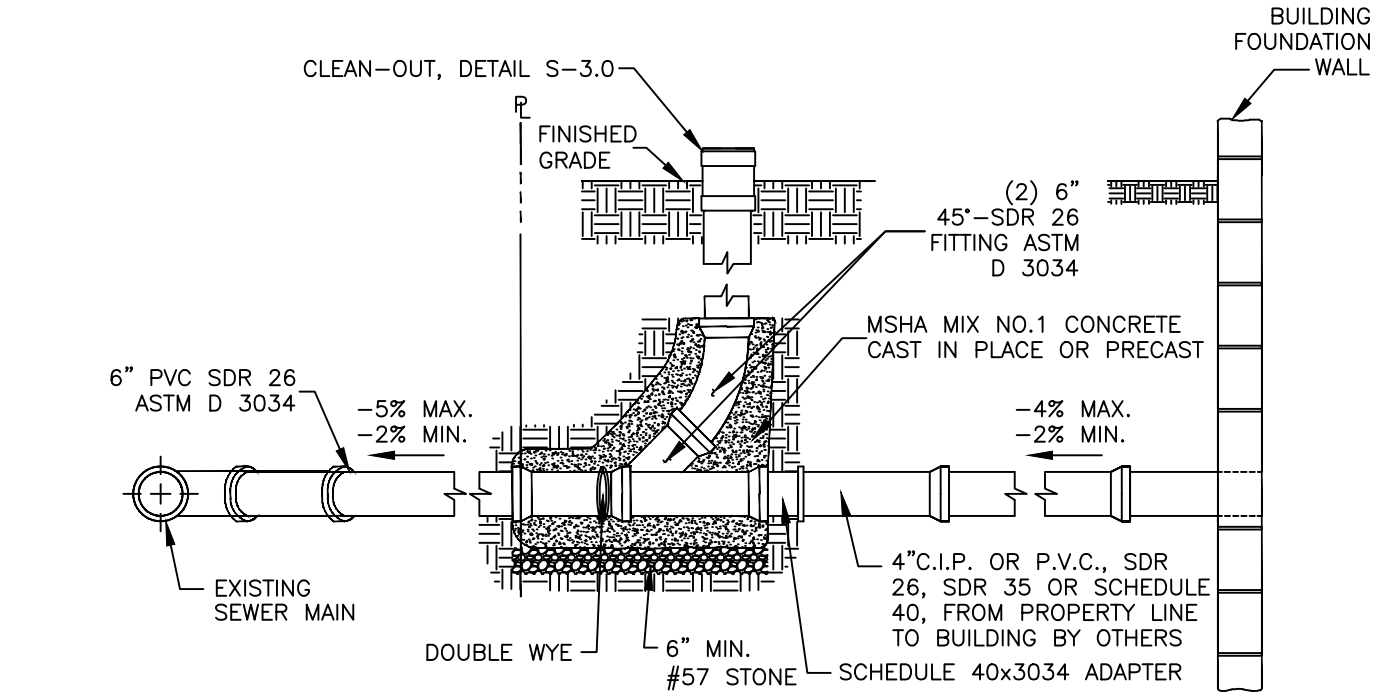
The City of Frederick Maryland

DROP CONNECTION TO SEWER MAIN

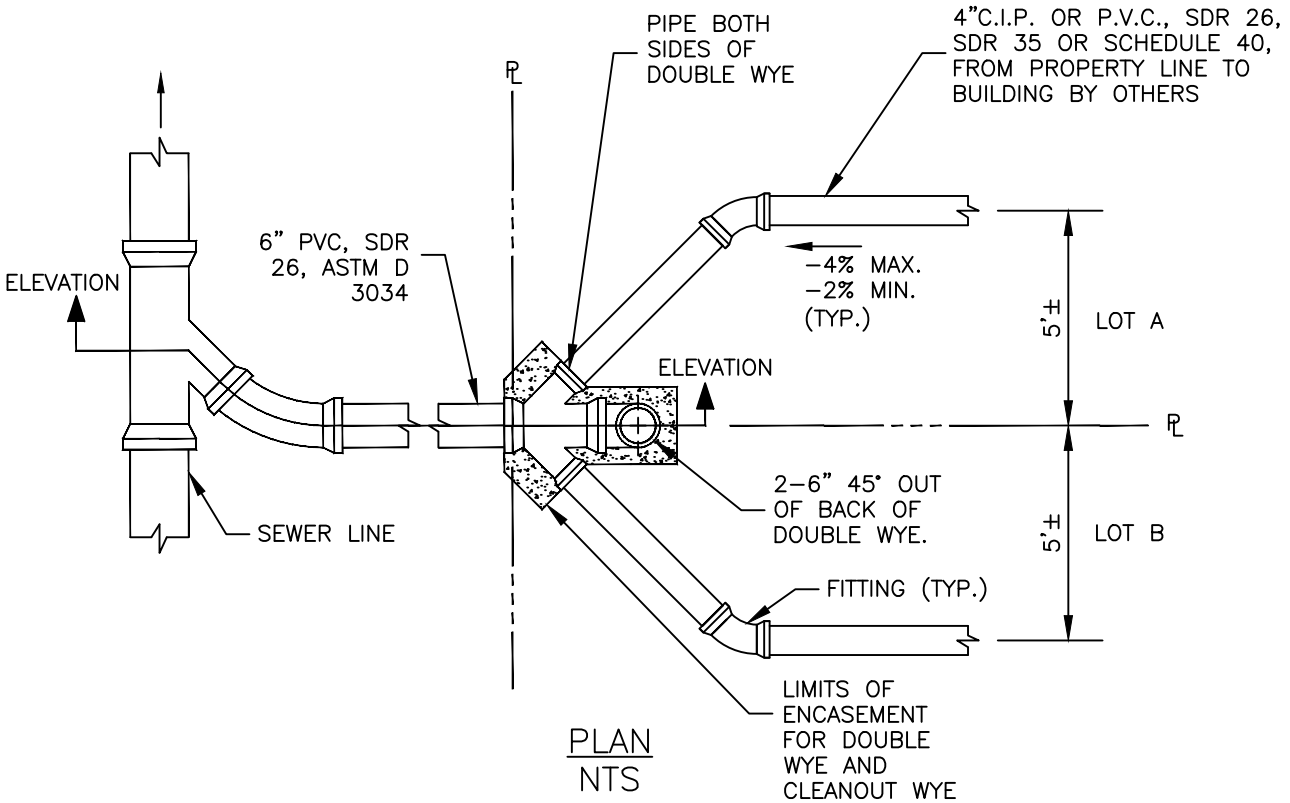
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-2.2

MARCH 2017



ELEVATION
NTS



PLAN
NTS

NOTE:

PER PLUMBING CODE, ADDITIONAL CLEANOUT PLUG TO BE LOCATED IN OR AT BUILDING.

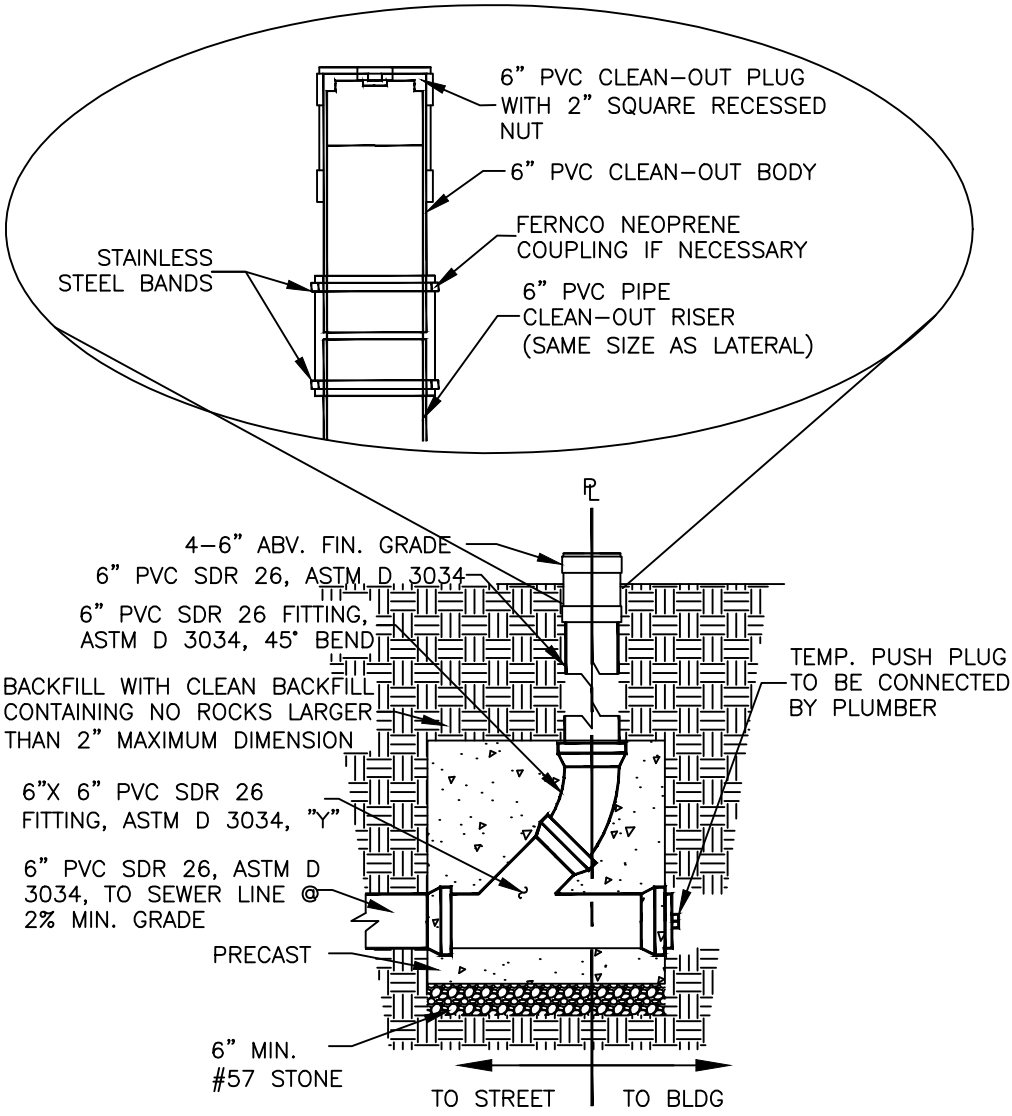
The City of Frederick Maryland

DOUBLE SEWER HOUSE CONNECTION (TOWNHOUSE AND EXISTING REPAIR ONLY)

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-2.3

MARCH 2017



SECTION
NTS

NOTES:

1. PER PLUMBING CODE, ADDITIONAL CLEANOUT PLUG TO BE LOCATED IN OR AT BUILDING.
2. CONTACT THE CITY OF FREDERICK INSPECTOR PRIOR TO FIELD ADJUSTMENT
3. PRECAST CONCRET SHALL BE MSHA MIX NO. 6 4000 PSI
4. AFTER INSTALLATION AND BEFORE COMPLETION OF ALL REQUIRED TESTING AND TV INSPECTION, CLEANOUT STACKS ARE TO BE CUT OFF AND CAPED (HARD CAP) AT AN ELEVATION 3' ABOVE TOP OF CURB OR EXISTING GRADE, WHICHEVER IS HIGHER.
5. CLEANOUT WILL BE SET TO 4-6" ABOVE FINISHED GRADE

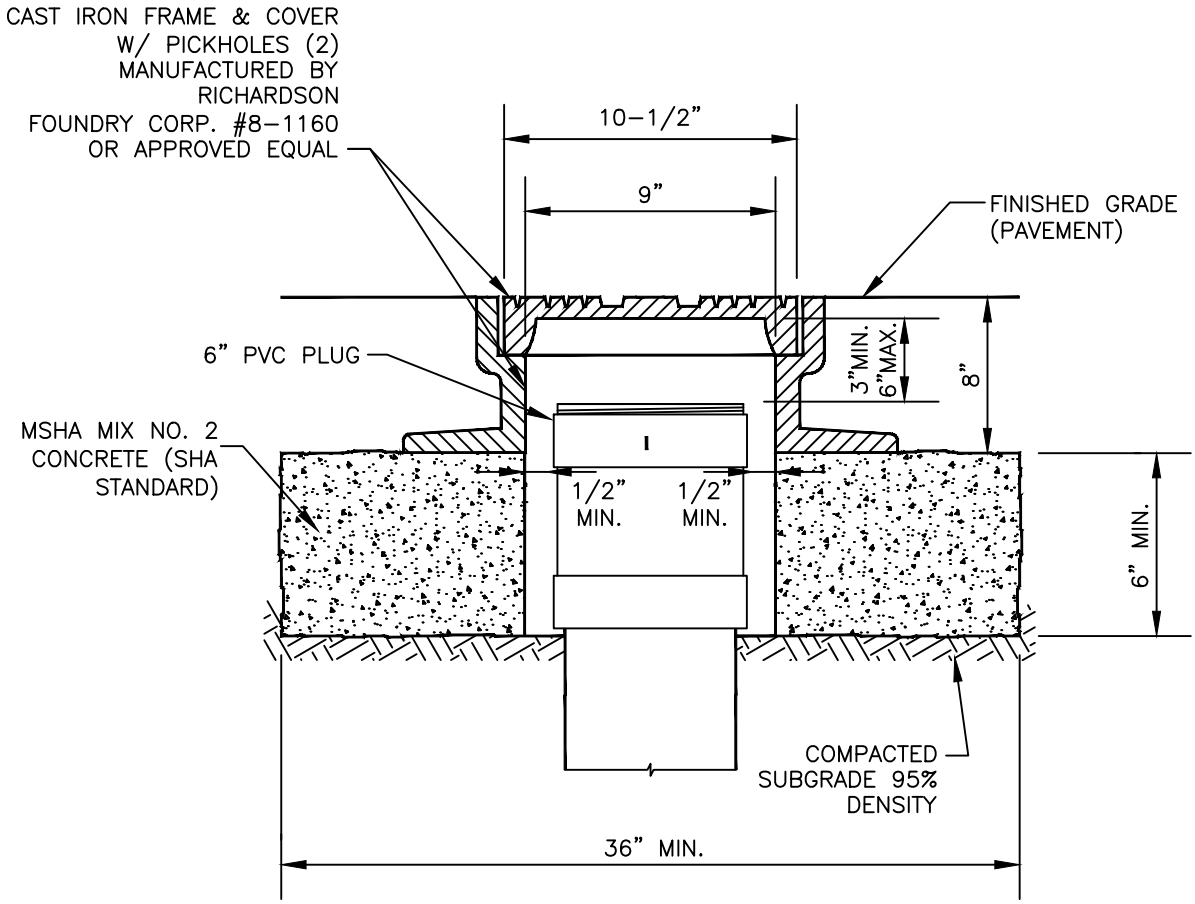
The City of Frederick Maryland

SEWER CLEAN-OUT

APPROVED: Zachary J. Kershner
DIRECTOR-DEPARTMENT PUBLIC WORKS

S-3.0

MARCH 2017



SECTION
NTS

NOTES:

1. PER PLUMBING CODE, ADDITIONAL CLEANOUT PLUG TO BE LOCATED IN OR AT BUILDING.
2. CONTACT THE CITY OF FREDERICK INSPECTOR PRIOR TO FIELD ADJUSTMENT
3. TO BE INSTALLED WHEN CLEAN OUT IS LOCATED WITHIN 2' OF DRIVEWAY.

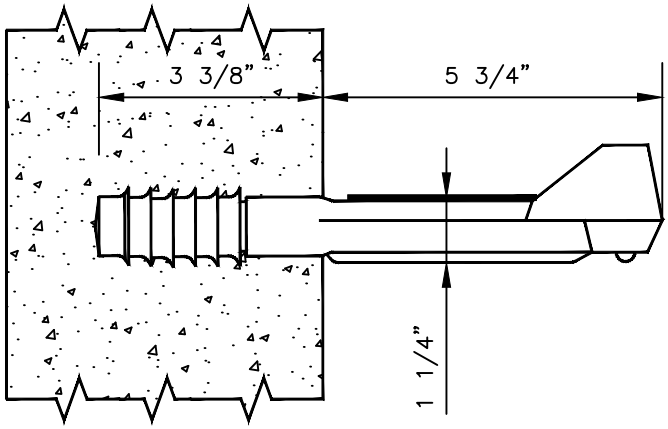
The City of Frederick Maryland

SEWER CLEAN-OUT SUBJECTED TO TRAFFIC

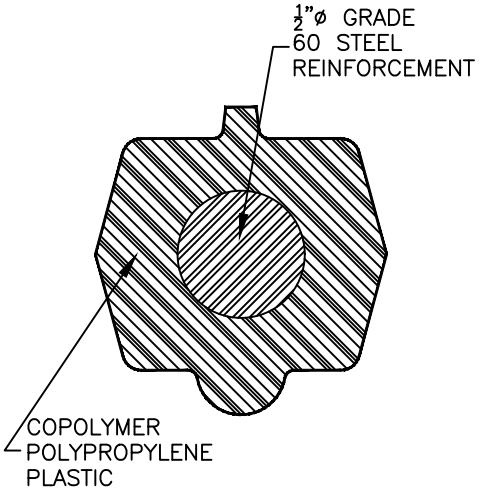
APPROVED: Zachary J. Kershner
DIRECTOR-DEPARTMENT PUBLIC WORKS

S-3.1

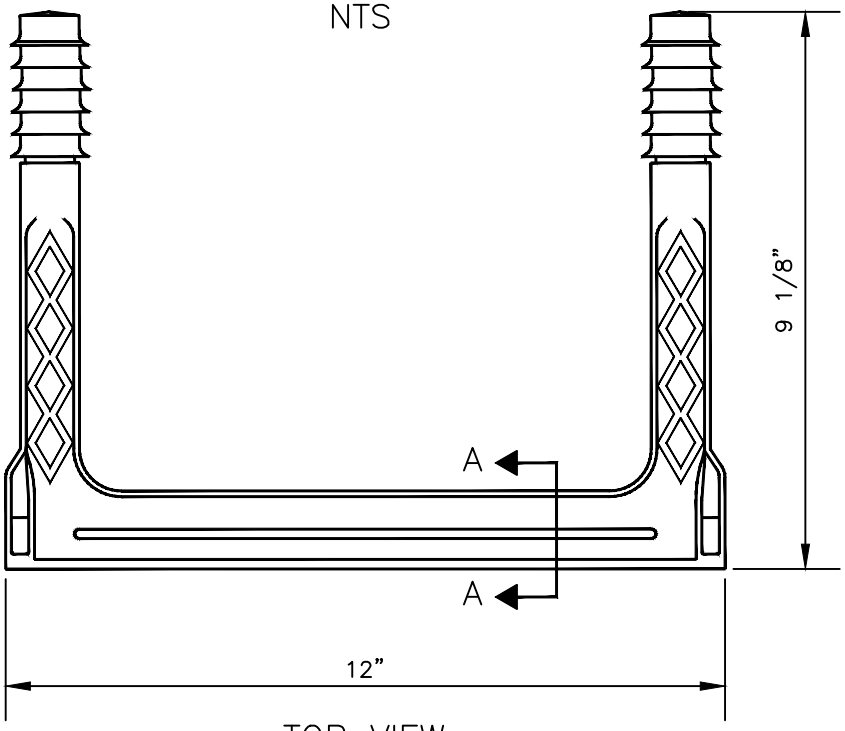
MARCH 2017



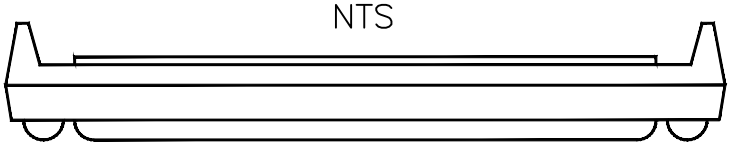
SIDE VIEW
NTS



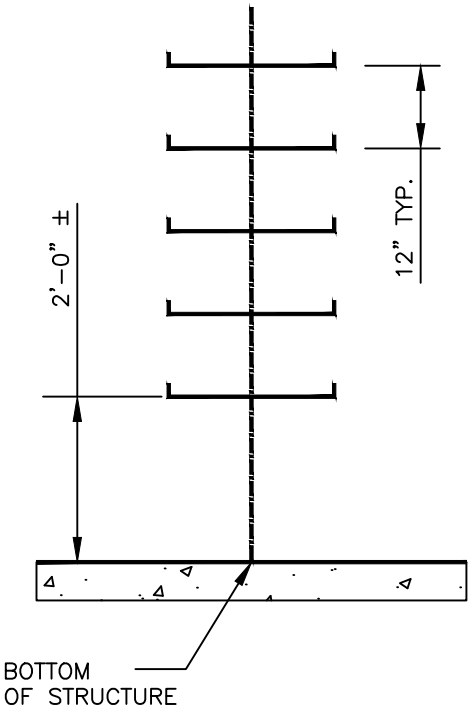
SECTION A–A
NTS



TOP VIEW
NTS



FRONT VIEW
NTS



TYPICAL LADDER STEP LOCATION
NTS

NOTE:

COPOLYMER POLYPROPYLENE SHALL BE CERTIFIED BY THE MANUFACTURER TO CONFORM TO ASTM D4101 AND HAVE A MINIMUM EXPOSED SECTION THICKNESS OF 1/8"

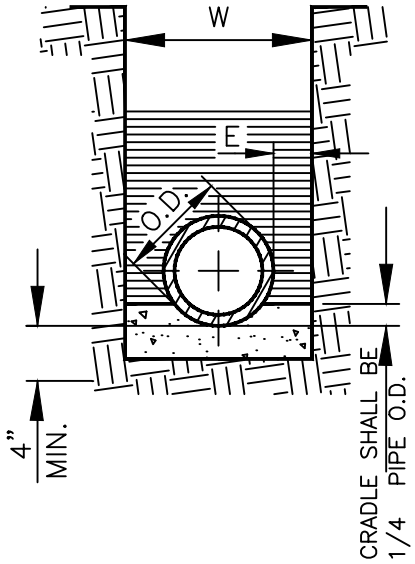
The City of Frederick Maryland

MANHOLE STEPS

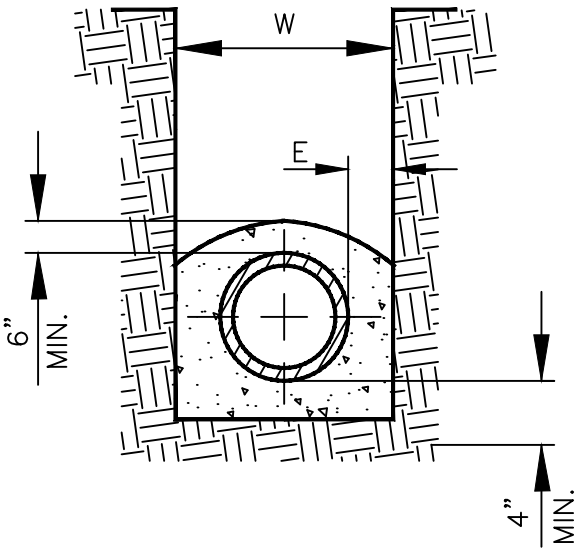
APPROVED: Zachary J. Kearbey
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-4.0

MARCH 2017



CONCRETE LOW CRADLE
NTS



CONCRETE ENCASEMENT
NTS

W = MAX. PAYMENT WIDTH = O.D. + 2E(IN.)
E = 9" FOR 6" TO 24" PIPE
E = 12" FOR 27" TO 36" PIPE
E = 15" FOR 42" TO 72" PIPE

NOTES:

1. WHEN WATER LINE CROSSES BELOW SEWER LINE ENCASEMENT SHOULD BE MINIMUM 10' EACH SIDE FROM CROSSING POINT BUT MUST EXTEND TO NEAREST SEWER PIPE BELL BEYOND THE 10' MINIMUM.
2. MSHA MIX NO. 1 CONCRETE.

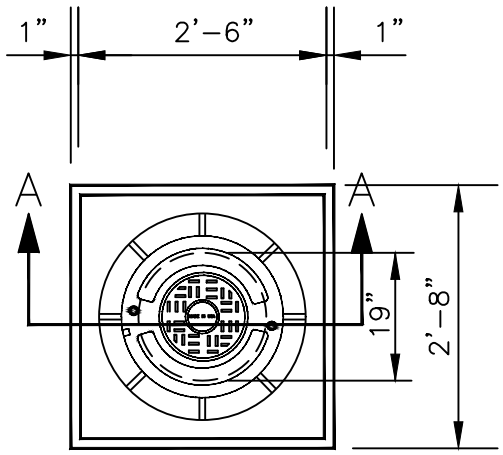
The City of Frederick Maryland

PIPE CRADLE AND ENCASEMENT

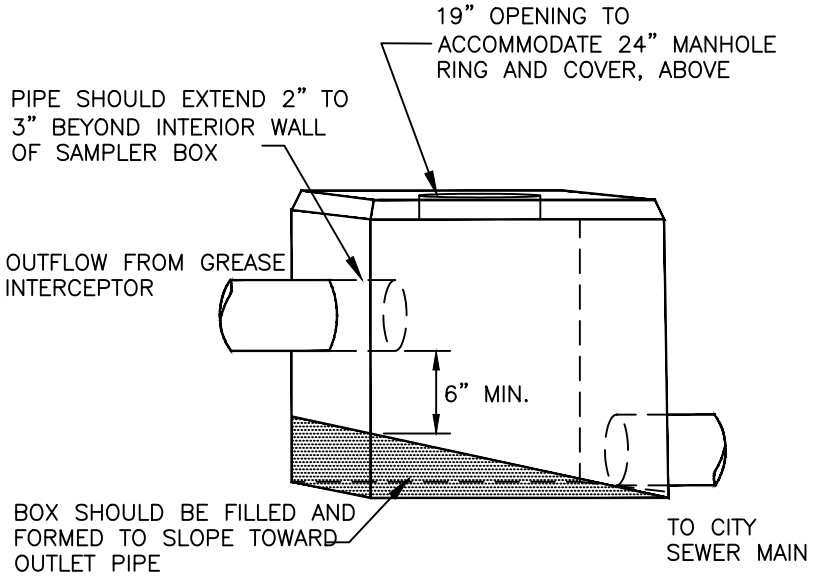
APPROVED: Zachary J. Kershner
DIRECTOR – DEPARTMENT PUBLIC WORKS

S-5.0

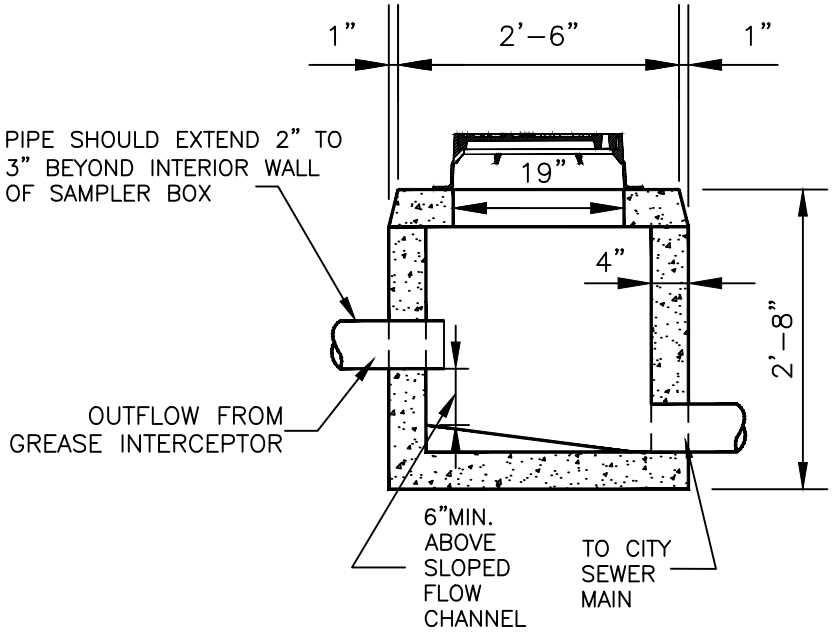
MARCH 2017



TOP VIEW
NTS



ISOMETRIC VIEW
NTS



SECTION A–A
NTS

NOTES:

1. INLET & OUTLETS SHALL BE A–LOK GASKETS OR APPROVED EQUAL
2. BOX MAY BE PRE–CAST OR CAST IN PLACE.
3. SLOPED FLOW CHANNEL SHALL BE MSHA MIX NO.2, POURED IN PLACE
4. HEAVY DUTY MH FRAME & COVER S–1.0

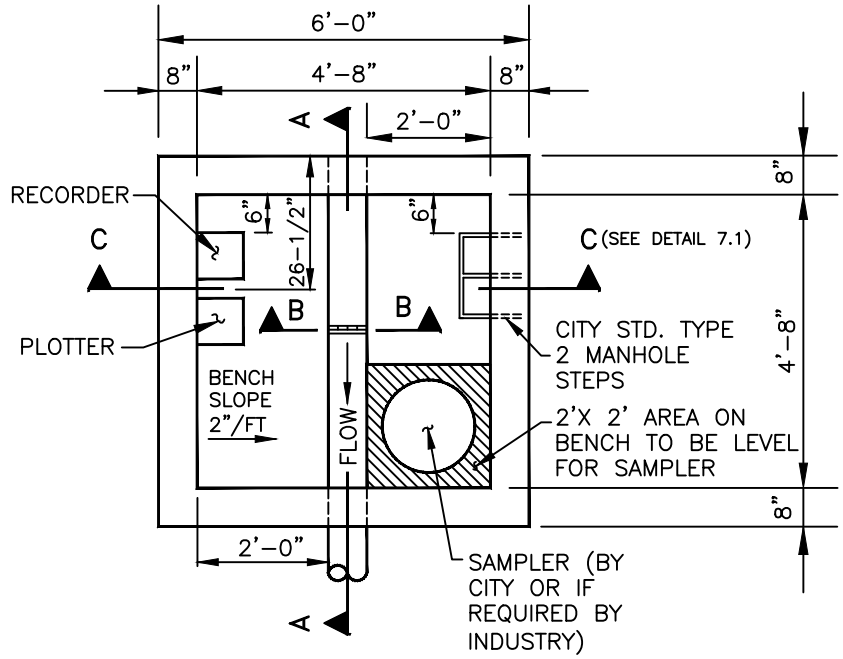
The City of Frederick Maryland

SAMPLER BOX

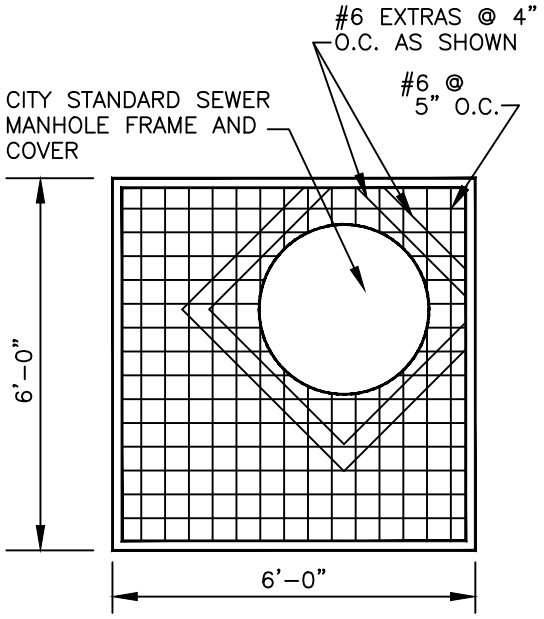
S-6.0

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

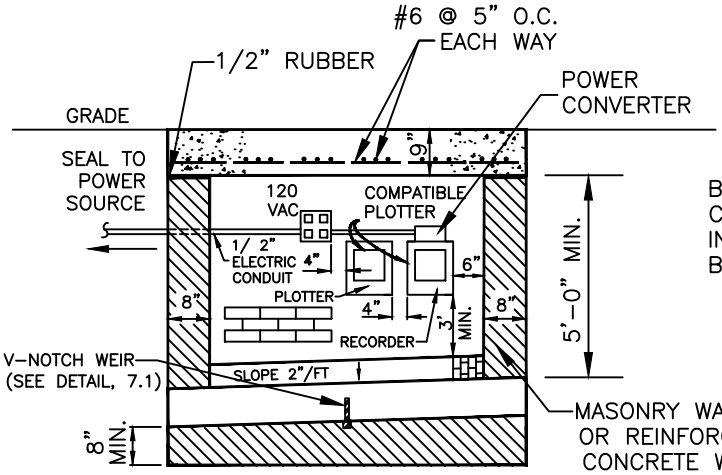
MARCH 2017



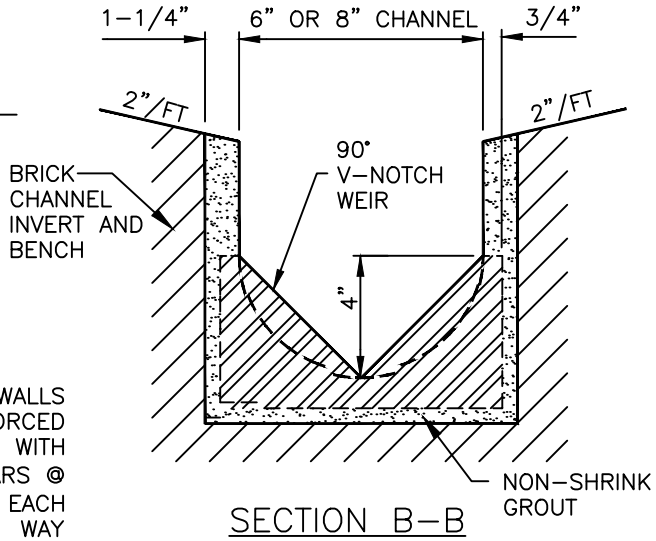
PLAN VIEW WITH TOP SLAB REMOVED
NTS



TOP SLAB
NTS



SECTION A–A
NTS



SECTION B–B
NTS

NOTES:

1. ALL ITEMS AS NOTED OR APPROVED EQUAL.
2. ASPHALT BASED WATERPROOF COATING FOR EXTERIOR OF MANHOLES SHALL BE MINERAL FILLED SOLVENT TYPE MEETING REQUIREMENTS OF MIL–C–82052.
2. FLEXIBLE PLASTIC GASKET BETWEEN MANHOLE AND MANHOLE FRAME SHALL BE EXTRUDED ROPE TYPE 'B' IN ACCORDANCE WITH AASHTO M–198, BUTYLE BASED, 3/4 INCH DIAMETER MIN. AND SHALL CONFORM TO ASTM C–443/C–361 FOR RUBBER TYPE GASKET JOINTS OR NEOPRENE ASTM D1056.
3. PRECAST CONCRETE MANHOLES ARE TO BE FURNISHED WITH A–LOK GASKETS OR APPROVED EQUAL BETWEEN SECTIONS.

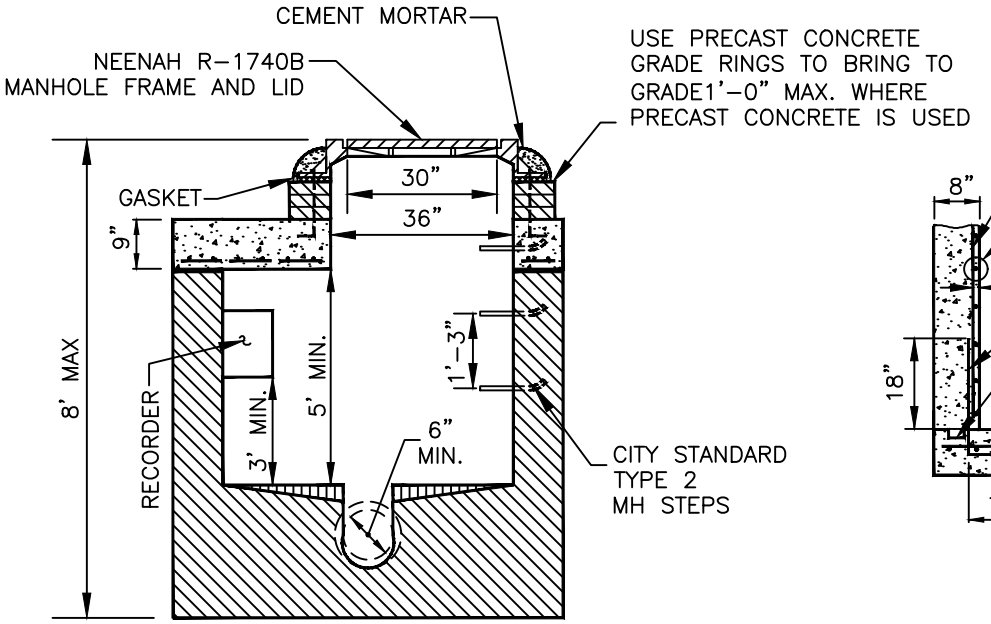
The City of Frederick Maryland

SAMPLER MANHOLE FOR INDUSTRIAL PRETREATMENT MONITORING (1 of 2)

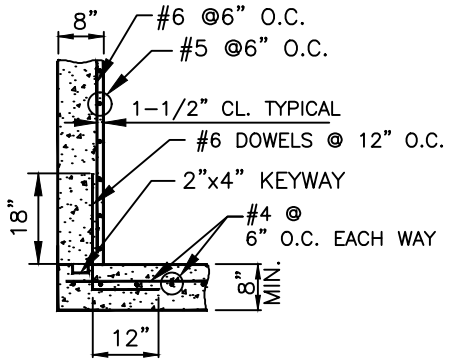
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-7.0

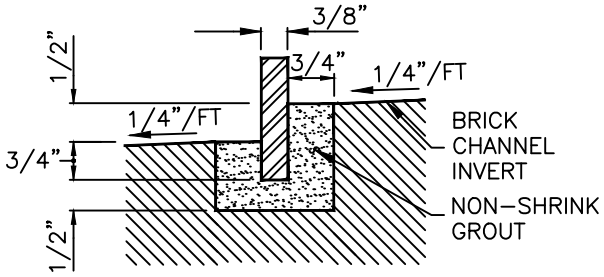
MARCH 2017



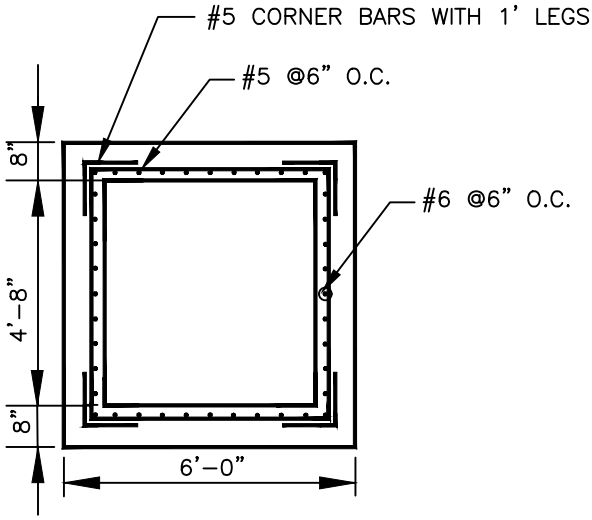
SECTION C-C
NTS



WALL/FLOOR DETAIL
NTS



V-NOTCH WEIR DETAIL
NTS



WALL REINFORCEMENT PLAN VIEW
NTS

NOTES:

1. ALL ITEMS AS NOTED OR APPROVED EQUAL.
2. ASPHALT BASED WATERPROOF COATING FOR EXTERIOR OF MANHOLES SHALL BE MINERAL FILLED SOLVENT TYPE MEETING REQUIREMENTS OF MIL-C-82052.
3. FLEXIBLE PLASTIC GASKET BETWEEN MANHOLE AND MANHOLE FRAME SHALL BE EXTRUDED ROPE TYPE 'B', IN ACCORDANCE WITH AASHTO M-198, BUTYLE BASED, 3/4 INCH DIAMETER MINIMUM.
4. IF PRECAST CONCRETE MANHOLES ARE USED THEY ARE TO BE FURNISHED WITH A-LOK GASKETS OR APPROVED EQUAL.

The City of Frederick Maryland

SAMPLER MANHOLE FOR INDUSTRIAL PRETREATMENT MONITORING - (2 of 2)

APPROVED: Zachary J. Kearbey
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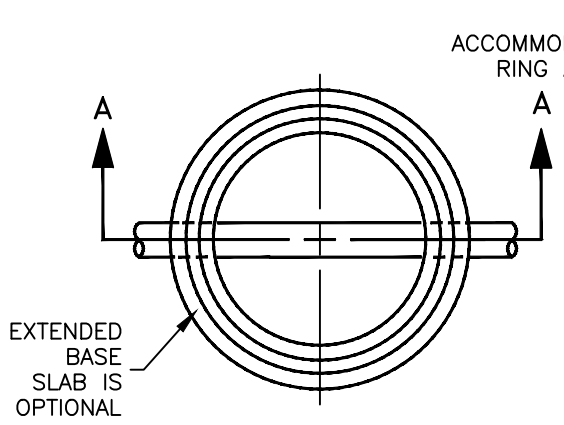
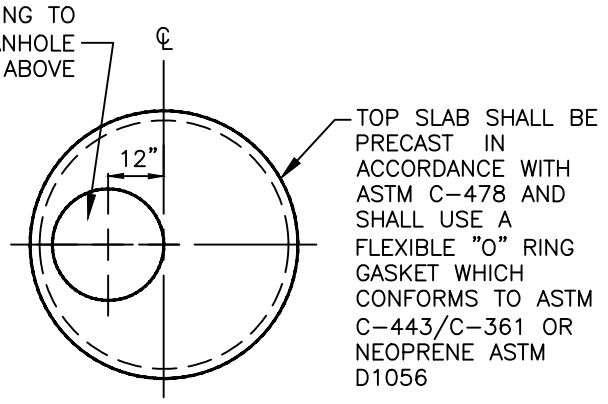
S-7.1

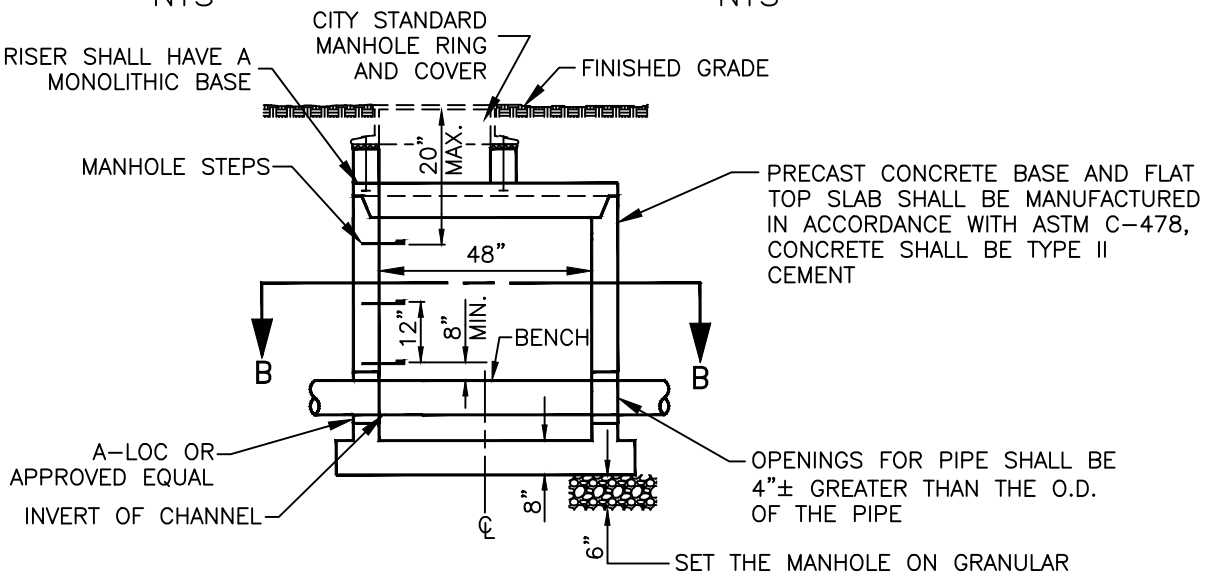
MARCH 2017



SECTION B–B
NTS



TOP SLAB
NTS



SECTION A–A
NTS

NOTES:

1. MORTAR TO BE TYPE II CEMENT MIXED PER CITY OF FREDERICK SPEC. (1PART CEMENT AND 2 ½ PARTS SAND, CONFORMING TO ASTM C144).
2. FLEXIBLE PLASTIC GASKET BETWEEN MANHOLE AND MANHOLE FRAME SHALL BE EXTRUDED ROPE TYPE 'B' IN ACCORDANCE WITH AASHTO M–198, BUTYLE BASED, 3/4 INCH DIAMETER MIN. AND SHALL CONFORM TO ASTM C–443/C–361 FOR RUBBER TYPE GASKET JOINTS OR NEOPRENE ASTM D1056.
3. PRECAST CONCRETE MANHOLES ARE TO BE FURNISHED WITH A–LOK GASKETS OR APPROVED EQUAL BETWEEN SECTIONS.
4. WHERE PRECAST CONCRETE IS USED, USE PRECAST CONCRETE GRADE RINGS LAID IN SOLID MASONRY JOINTS TO BRING TO GRADE, 12" MAXIMUM.
5. 20" MAXIMUM DISTANCE BETWEEN COVER AND FIRST MANHOLE STEP.
6. LIFTING HOLES SHALL BE PROVIDED IN BASE AND TOP SLAB WITH RUBBER PLUG & MORTAR TO SEAL HOLES.
7. HEAVY DUTY MH FRAME & COVER S–1.0

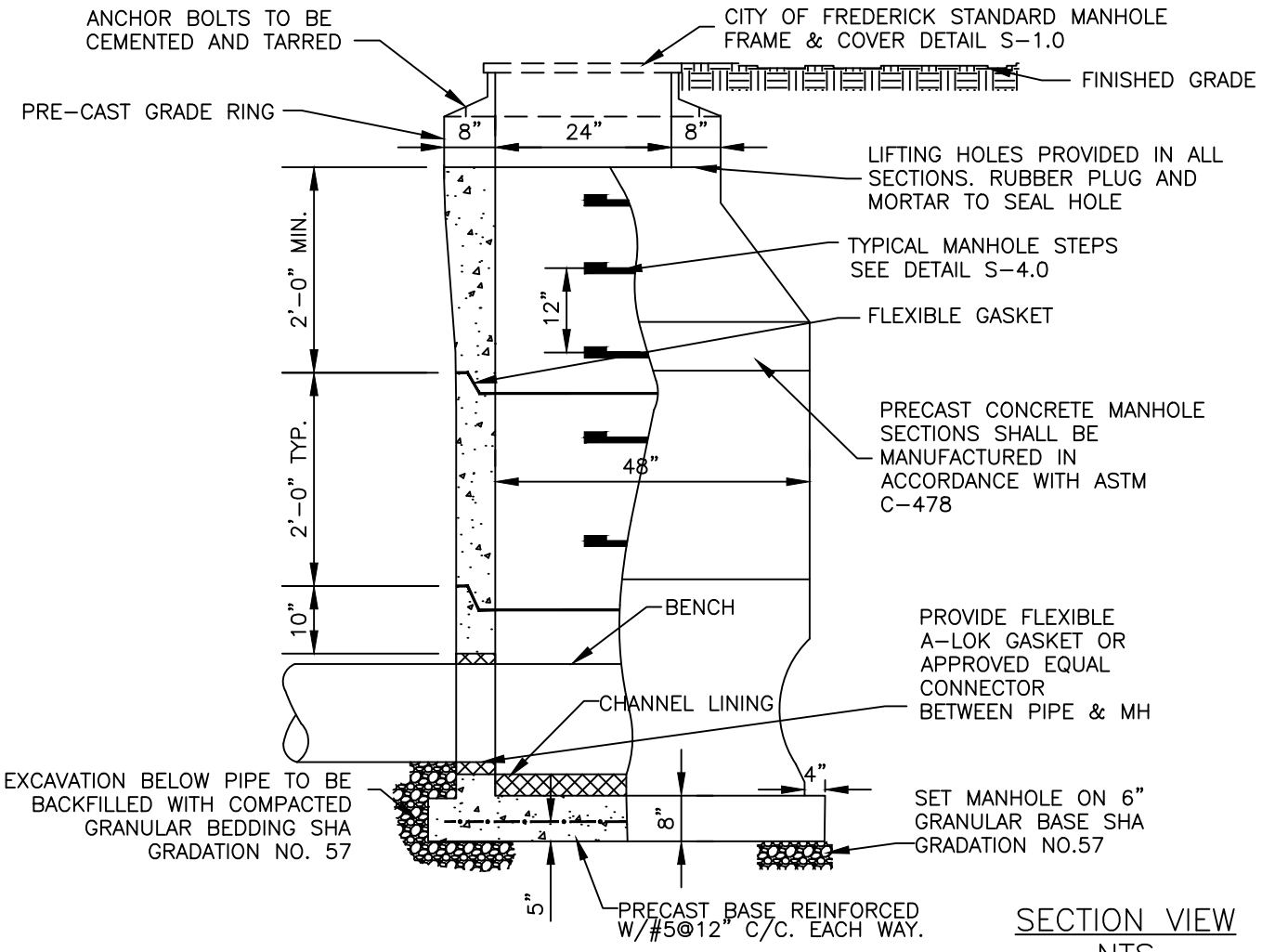
The City of Frederick Maryland

48" PRECAST SHALLOW MANHOLE

APPROVED: Zachary J. Kearbey
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-8.0

MARCH 2017



SECTION VIEW
NTS

NOTES:

1. MORTAR TO BE TYPE II CEMENT MIXED PER CITY OF FREDERICK SPEC. (1PART CEMENT AND 2 ½ PARTS SAND, CONFORMING TO ASTM C144).
2. FLEXIBLE PLASTIC GASKET BETWEEN MANHOLE AND MANHOLE FRAME SHALL BE EXTRUDED ROPE TYPE 'B' IN ACCORDANCE WITH AASHTO M-198, BUTYLE BASED, 3/4 INCH DIAMETER MIN. AND SHALL CONFORM TO ASTM C-443/C-361 FOR RUBBER TYPE GASKET JOINTS OR NEOPRENE ASTM D1056.
3. PRECAST CONCRETE MANHOLES ARE TO BE FURNISHED WITH A-LOK GASKETS OR APPROVED EQUAL BETWEEN PIPE AND STRUCTURE.
4. WHERE PRECAST CONCRETE IS USED, USE PRECAST CONCRETE GRADE RINGS LAID IN SOLID MASONRY JOINTS TO BRING TO GRADE, 12" MAXIMUM.
5. 20" MAXIMUM DISTANCE BETWEEN COVER AND FIRST MANHOLE STEP.
6. LIFTING HOLES SHALL BE PROVIDED IN BASE AND TOP SLAB WITH RUBBER PLUG & MORTAR TO SEAL HOLES.
7. 48" MANHOLE RISER SECTIONS FURNISHED IN 1', 2', 3' & 4' HEIGHTS.
8. THE CONCRETE STRENGTH CLASS OF ALL RISERS IN EACH MANHOLE TO BE THE SAME.

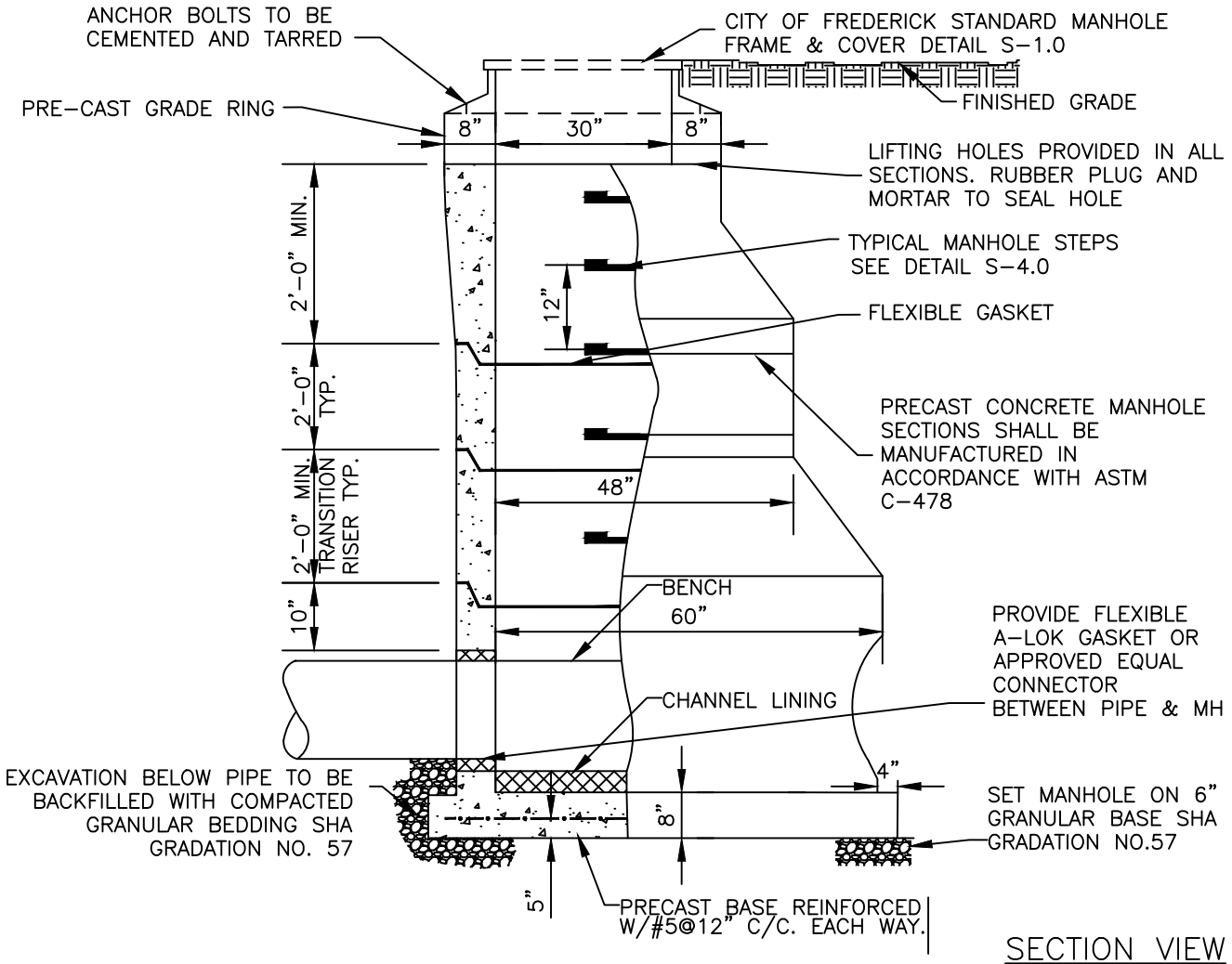
The City of Frederick Maryland

48" PRECAST MANHOLE

APPROVED: Zachary J. Kershner
DIRECTOR-DEPARTMENT PUBLIC WORKS

S-9.0

MARCH 2017



SECTION VIEW
NTS

NOTES:

1. MORTAR TO BE TYPE II CEMENT MIXED PER CITY OF FREDERICK SPEC. (1PART CEMENT AND 2 ½ PARTS SAND, CONFORMING TO ASTM C144).
2. FLEXIBLE PLASTIC GASKET BETWEEN MANHOLE AND MANHOLE FRAME SHALL BE EXTRUDED ROPE TYPE 'B' IN ACCORDANCE WITH AASHTO M-198, BUTYLE BASED, 3/4 INCH DIAMETER MIN. AND SHALL CONFORM TO ASTM C-443/C-361 FOR RUBBER TYPE GASKET JOINTS OR NEOPRENE ASTM D1056.
3. PRECAST CONCRETE MANHOLES ARE TO BE FURNISHED WITH A-LOK GASKETS OR APPROVED EQUAL BETWEEN PIPE AND STRUCTURE.
4. WHERE PRECAST CONCRETE IS USED, USE PRECAST CONCRETE GRADE RINGS LAID IN SOLID MASONRY JOINTS TO BRING TO GRADE, 12" MAXIMUM.
5. 20" MAXIMUM DISTANCE BETWEEN COVER AND FIRST MANHOLE STEP.
6. LIFTING HOLES SHALL BE PROVIDED IN BASE AND TOP SLAB WITH RUBBER PLUG & MORTAR TO SEAL HOLES.
7. 48" MANHOLE RISER SECTIONS FURNISHED IN 1', 2', 3' & 4' HEIGHTS.
8. THE CONCRETE STRENGTH CLASS OF ALL RISERS IN EACH MANHOLE TO BE THE SAME.

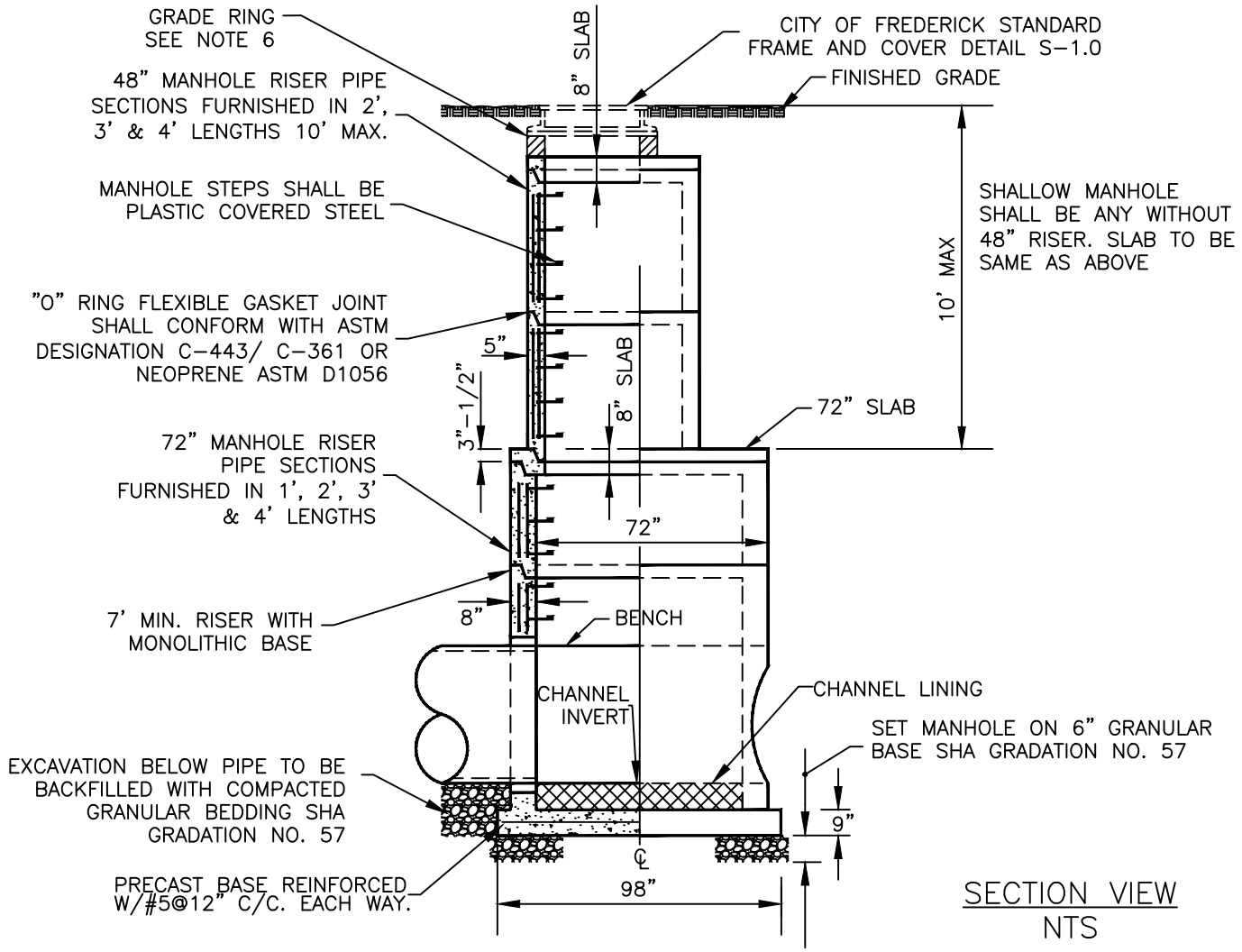
The City of Frederick Maryland

60" PRECAST MANHOLE

APPROVED: Zachary J. Kearbey
DIRECTOR-DEPARTMENT PUBLIC WORKS

S-9.1

MARCH 2017



SECTION VIEW
NTS

NOTES:

1. WHERE DEPTH OF 48" RISER EXCEEDS 10' SPECIAL DESIGN OF 72" SLAB REQUIRED.
2. 20" MAXIMUM DISTANCE FROM MANHOLE COVER TO FIRST MANHOLE STEP.
3. MORTAR TO BE TYPE II CEMENT MIXED PER CITY OF FREDERICK SPEC. (1PART CEMENT AND 2 ½ PARTS SAND, CONFORMING TO ASTM C144).
4. FLEXIBLE PLASTIC GASKET BETWEEN MANHOLE AND MANHOLE FRAME SHALL BE EXTRUDED ROPE TYPE 'B' IN ACCORDANCE WITH AASHTO M-198, BUTYLE BASED, 3/4 INCH DIAMETER MINIMUM.
5. PRECAST CONCRETE MANHOLES ARE TO BE FURNISHED WITH A-LOK GASKETS OR APPROVED EQUAL.
6. WHERE PRECAST CONCRETE IS USED, USE PRECAST CONCRETE GRADE RINGS LAID IN SOLID MASONRY JOINTS TO BRING TO GRADE, 12" MAXIMUM.
7. SLAB ON 48" RISER TO HAVE 24" OPENING. STEEL TO BE SAME AS 72" SLAB EXCEPT BOTTOM MAT TO BE ALL 1/2" BARS.
8. ALL MANHOLES BASES, RISERS, CONES AND FLAT SLABS SHALL BE PRECAST CONCRETE IN ACCORDANCE WITH ASTM C-478 AS MODIFIED HEREIN. USE TYPE II CEMENT.
9. DOUBLE WRAP CIRCUMFERENTIAL STEEL IN BELLS.
10. STEEL IN BASE TO BE 1/2" DIAMETER @16" O.C. EACH WAY MINIMUM.

The City of Frederick Maryland

72" PRECAST MANHOLE

S-9.2

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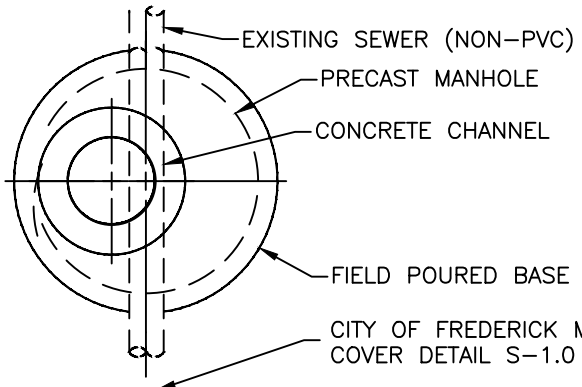
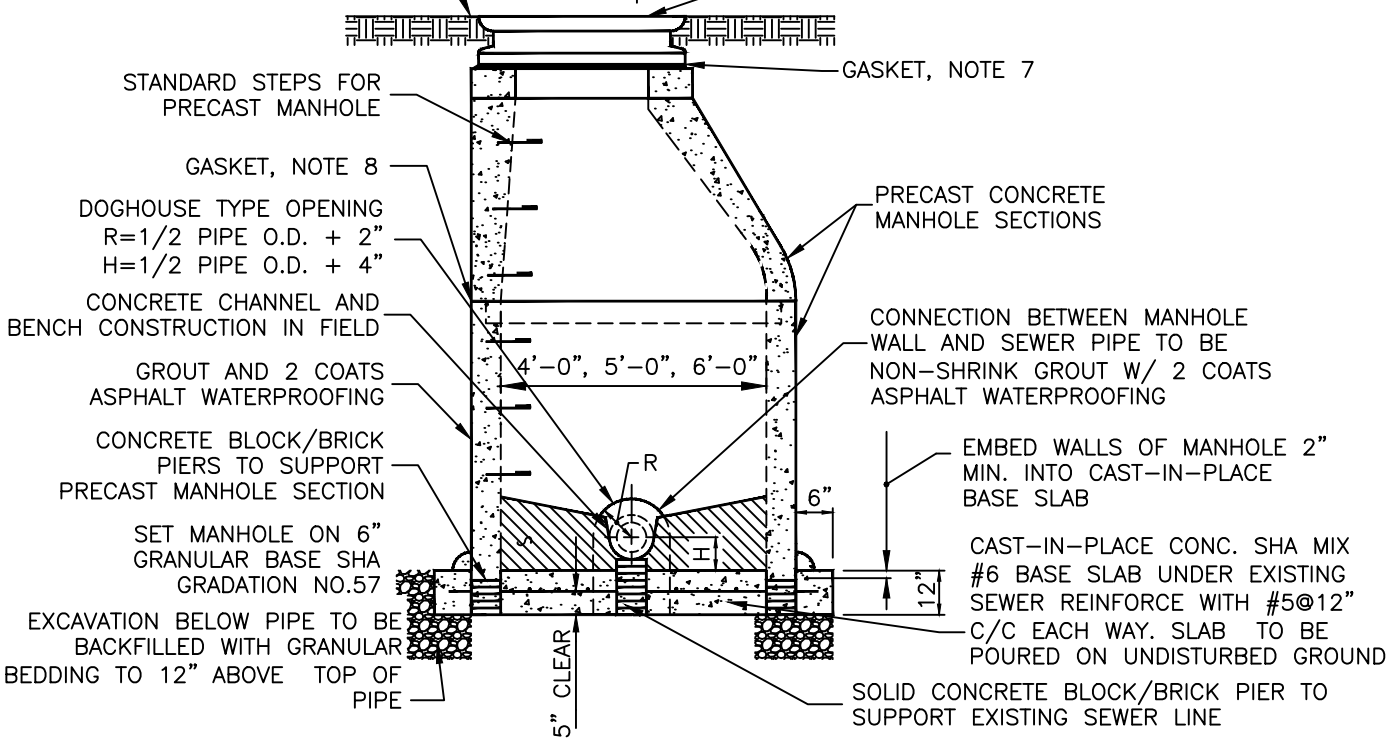
MARCH 2017

PLAN VIEW
NTS





SECTION VIEW
NTS

NOTES:

1. USE EXTREME CAUTION WHEN DIGGING ADJACENT TO EXISTING SEWER LINE.
2. EXCAVATION DIRECTLY BELOW EXISTING SEWER LINE TO BE DONE BY HAND.
3. PRECAST CONCRET SHALL BE MSHA MIX NO. 6 4000 PSI
4. SUPPORT EXISTING SEWER LINE WITH BRICK PIERS AS NEEDED.
5. MORTAR TO BE TYPE II CEMENT MIXED PER CITY OF FREDERICK SPEC. (1PART CEMENT AND 2 ½ PARTS SAND, CONFORMING TO ASTM C144).
6. 20" MAXIMUM BETWEEN MANHOLE COVER AND FIRST MANHOLE STEP.
7. TOP OF EXISTING SEWER LINE TO BE REMOVED AS NEEDED/ AS DIRECTED IN THE FIELD BY CITY INSPECTORS.
8. FLEXIBLE PLASTIC GASKET BETWEEN MANHOLE AND MANHOLE FRAME SHALL BE EXTRUDED ROPE TYPE 'B' IN ACCORDANCE WITH AASHTO M–198, BUTYLE BASED, 3/4 INCH DIAMETER MIN. AND SHALL CONFORM TO ASTM C–443/C–361 FOR RUBBER TYPE GASKET JOINTS OR NEOPRENE ASTM D1056.
9. WHEN PRECAST CONCRETE MANHOLES ARE USED THEY ARE TO BE FURNISHED WITH GASKETS.
10. WHERE PRECAST CONCRETE IS USED, USE PRECAST CONCRETE GRADE RINGS LAID IN SOLID MASONRY JOINTS TO BRING TO GRADE, 12" MAXIMUM.

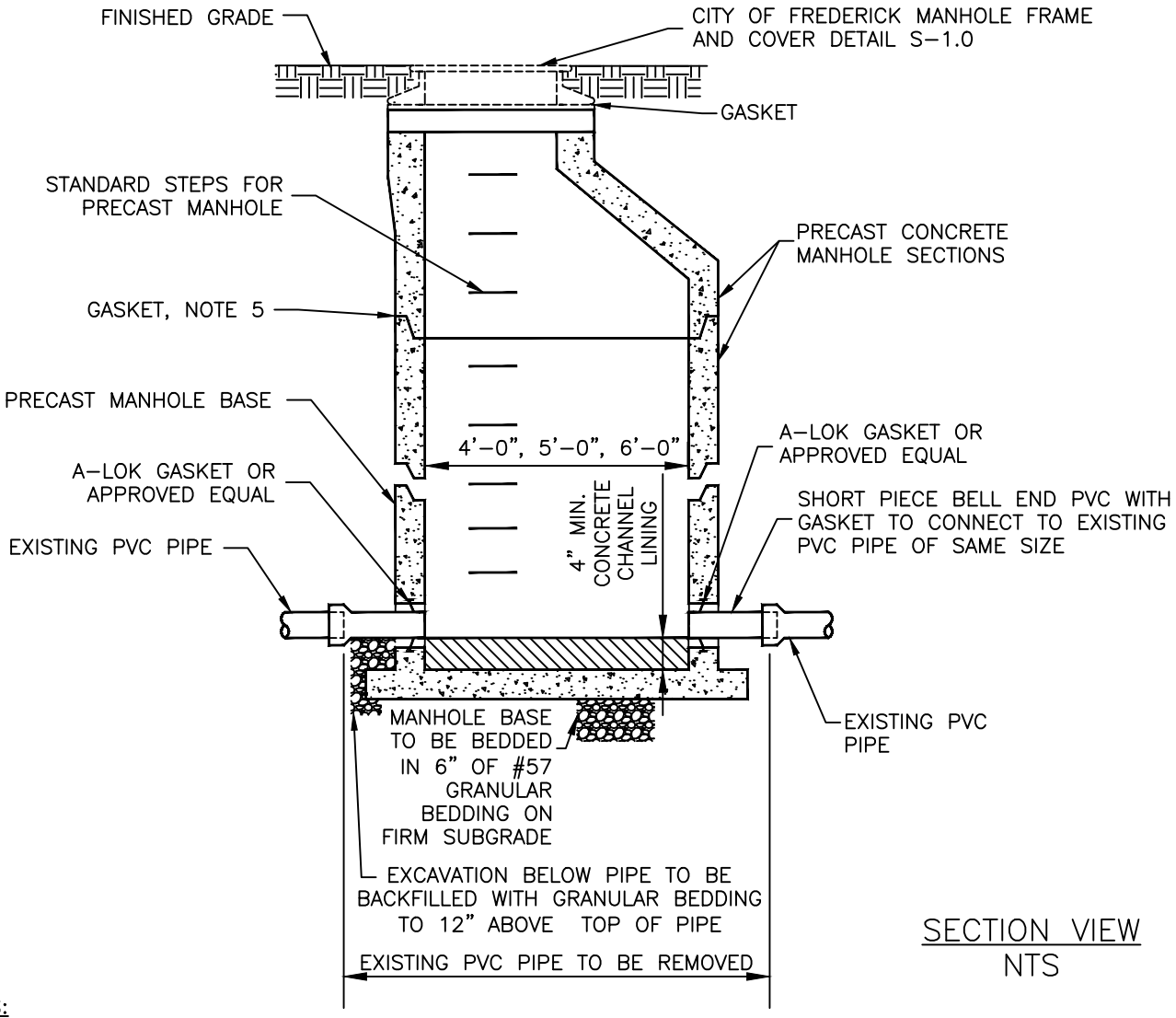
The City of Frederick Maryland

PRECAST CONCRETE MANHOLE BUILT OVER EXISTING SEWER

APPROVED: Zachary J. Kearbey
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-10.0

MARCH 2017



SECTION VIEW
NTS

NOTES:

1. USE EXTREME CAUTION WHEN DIGGING ADJACENT TO EXISTING SEWER LINE.
3. PRECAST CONCRET SHALL BE MSHA MIX NO. 6 4000 PSI
4. MORTAR TO BE TYPE II CEMENT MIXED PER CITY OF FREDERICK SPEC. (1PART CEMENT AND 2 ½ PARTS SAND, CONFORMING TO ASTM C144).
5. 20" MAXIMUM BETWEEN MANHOLE COVER AND FIRST MANHOLE STEP.
6. EXISTING SEWER LINE TO BE REMOVED AS NEEDED AND AS DIRECTED IN THE FIELD BY CITY INSPECTORS.
7. FLEXIBLE PLASTIC GASKET BETWEEN MANHOLE AND MANHOLE FRAME SHALL BE EXTRUDED ROPE TYPE 'B' IN ACCORDANCE WITH AASHTO M-198, BUTYLE BASED, 3/4 INCH DIAMETER MIN. AND SHALL CONFORM TO ASTM C-443/C-361 FOR RUBBER TYPE GASKET JOINTS OR NEOPRENE ASTM D1056.
8. WHERE PRECAST CONCRETE IS USED, USE PRECAST CONCRETE GRADE RINGS LAID IN SOLID MASONRY JOINTS TO BRING TO GRADE, 12" MAXIMUM.
9. WITH PRIOR APPROVAL FROM CITY OF FREDERICK SEWER DEPT. SUPERINTENDENT, MAINTAIN AND HANDLE SEWER FLOW DURING INSTALLATION.

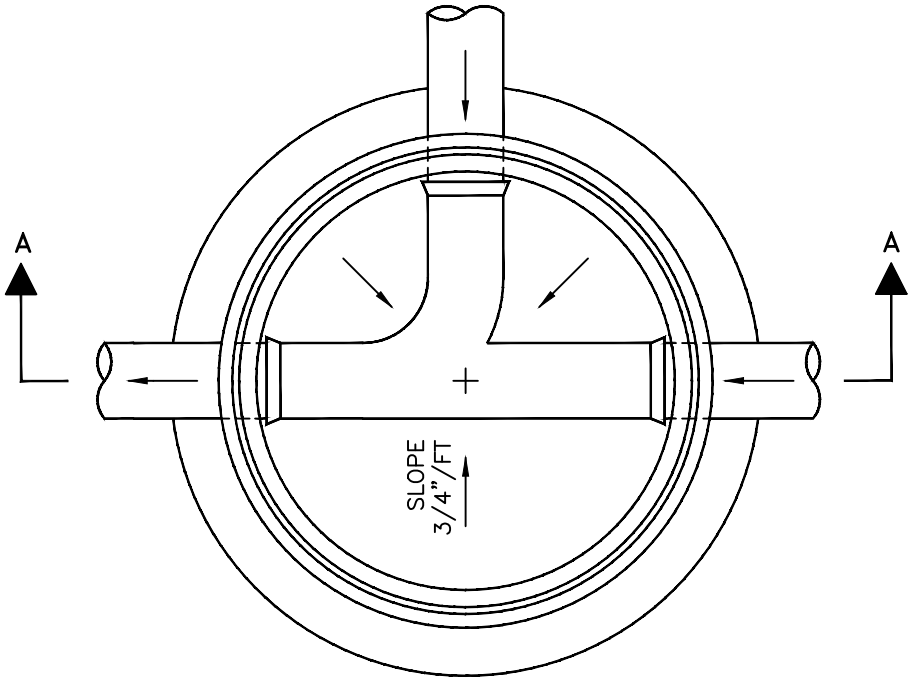
The City of Frederick Maryland

PRECAST CONCRETE MANHOLE BUILT ON EXISTING PVC PIPE

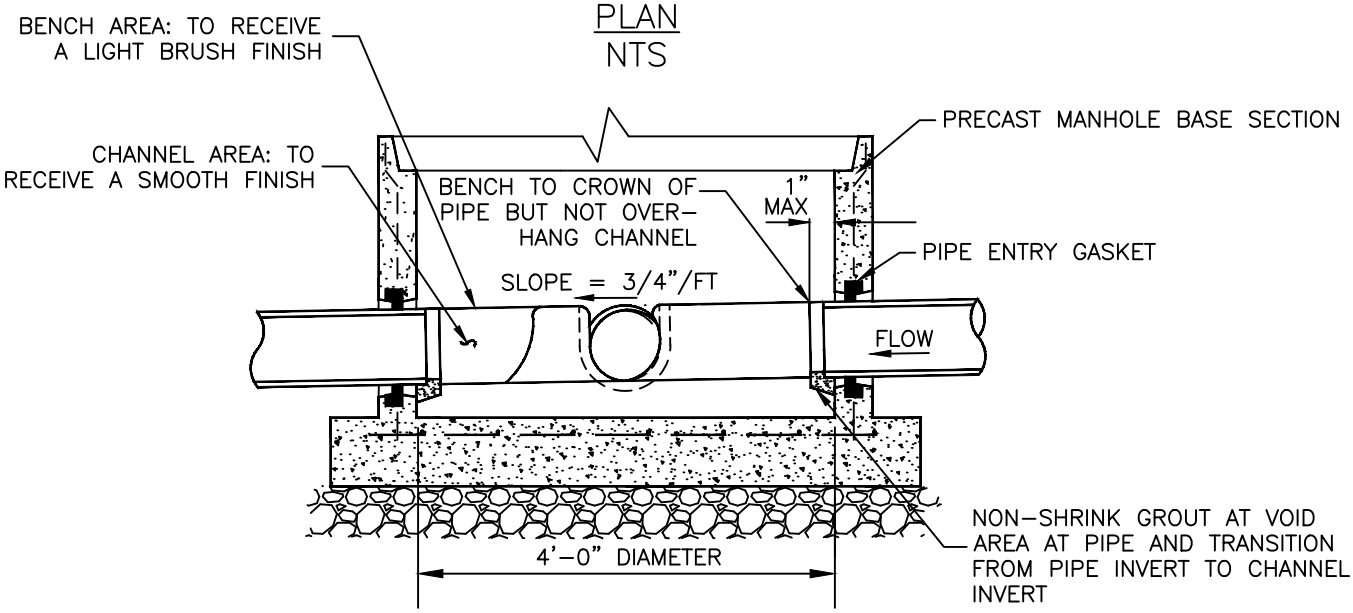
S-10.1

APPROVED: Zachary J. Kershner
DIRECTOR-DEPARTMENT PUBLIC WORKS

MARCH 2017



PLAN
NTS



SECTION A-A
NTS

NOTES:

1. CHANNELS CAN BE FORMED TO ACCOMMODATE PIPES ENTERING MANHOLE AT ANY ANGLE.
2. FLOW CHANNELS SHALL BE CAST USING CHANNEL FORMS TO ASSURE UNIFORMITY IN SIZE AND SHAPE OF CHANNEL.
3. CONCRETE SHALL BE SHA MIX NO. 3 3500 PSI FOR CHANNEL.

The City of Frederick Maryland

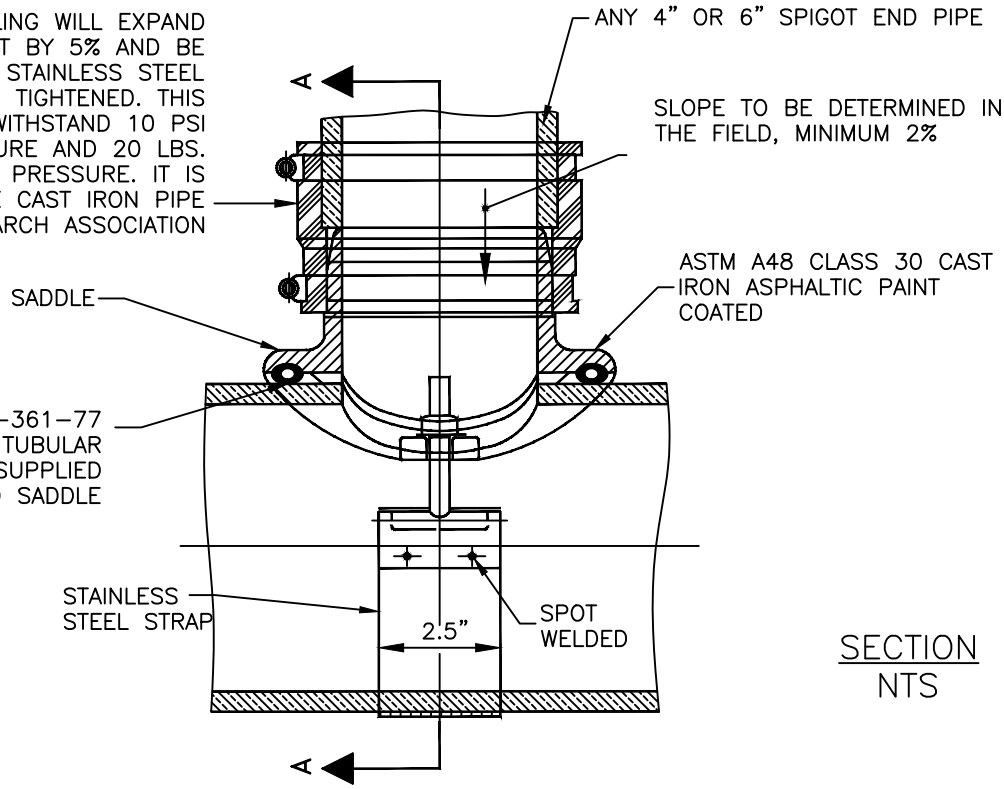
PRECAST CONCRETE FLOW CHANNELS FOR SEWER MANHOLE BASES

APPROVED: _____
DIRECTOR-DEPARTMENT PUBLIC WORKS

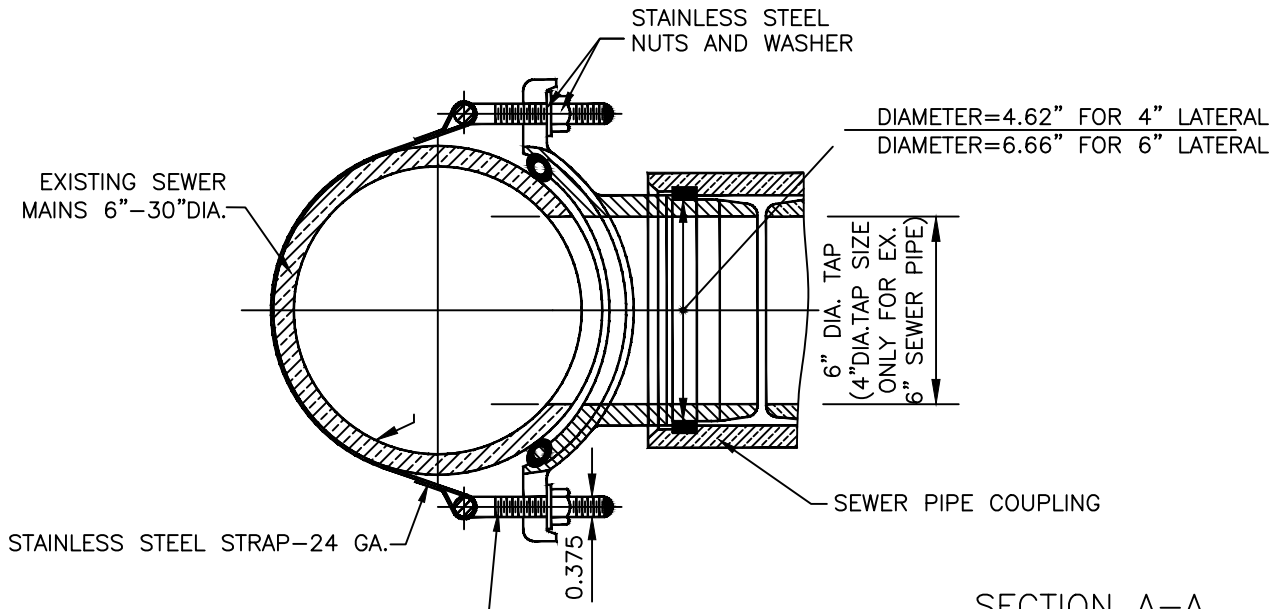
S-10.2

MARCH 2017

ELASTOMERIC COUPLING WILL EXPAND OR CONTRACT BY 5% AND BE EFFECTIVE WHEN STAINLESS STEEL CLAMPS ARE TIGHTENED. THIS CONNECTION WILL WITHSTAND 10 PSI INTERNAL PRESSURE AND 20 LBS. EXTERNAL HEAD PRESSURE. IT IS APPROVED BY THE CAST IRON PIPE RESEARCH ASSOCIATION



SECTION
NTS



SECTION A-A
NTS

NOTES:

1. TAPPING SADDLE TO BE SEALTITE "US" AS SUPPLIED BY GENECO OR APPROVED EQUAL.
2. TAPPING SADDLE SHOULD BE SUPPORTED BY MIN. 6" CONCRETE ENCASEMENT
3. ELASTOMERIC COUPLING AS SUPPLIED BY FERNCO OR APPROVED EQUAL.
4. HOLE FOR SEWER CONNECTION TO BE MACHINE TAPPED ONLY.
5. ANGLE OF TAP TO BE DETERMINED IN THE FIELD.
6. TAPPING TO REMAIN 12" AWAY FROM EXISITNG JOINTS

The City of Frederick Maryland

TAPPING SADDLE FOR 6" TO 30" SEWER MAINS

APPROVED: Zachary J. Kershner
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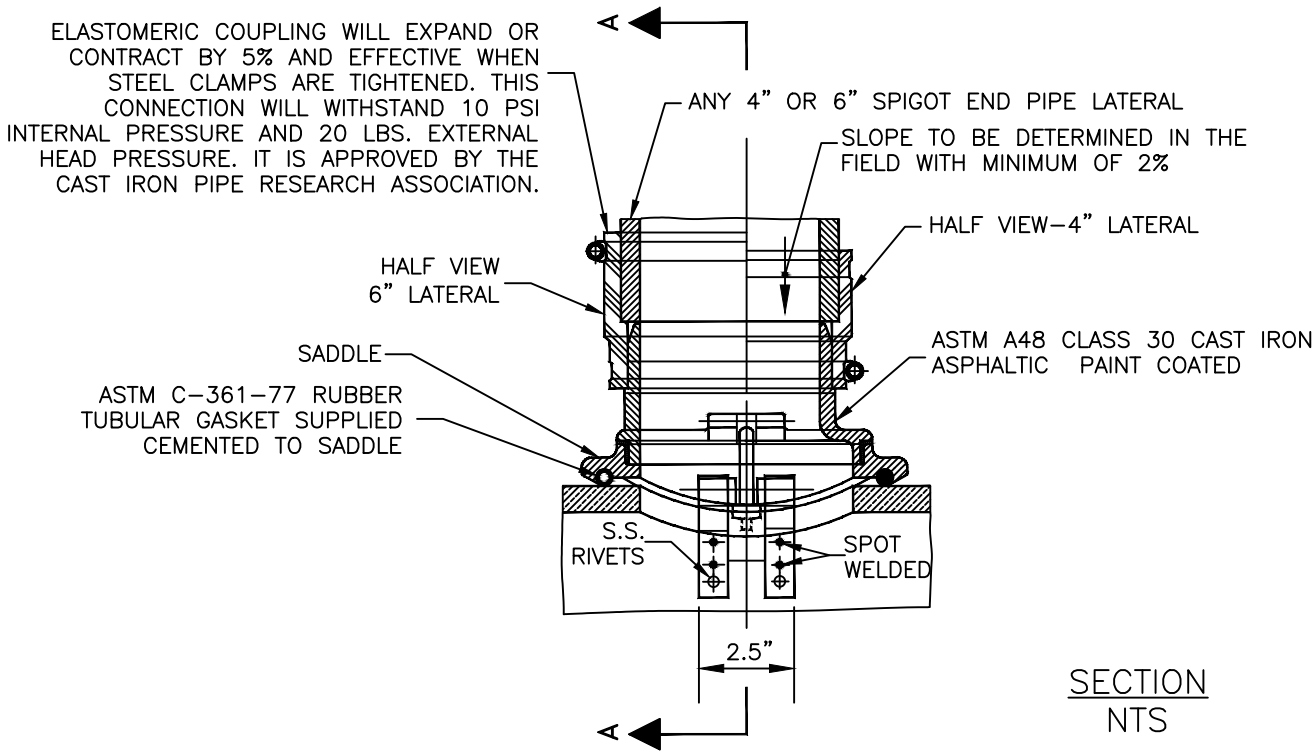
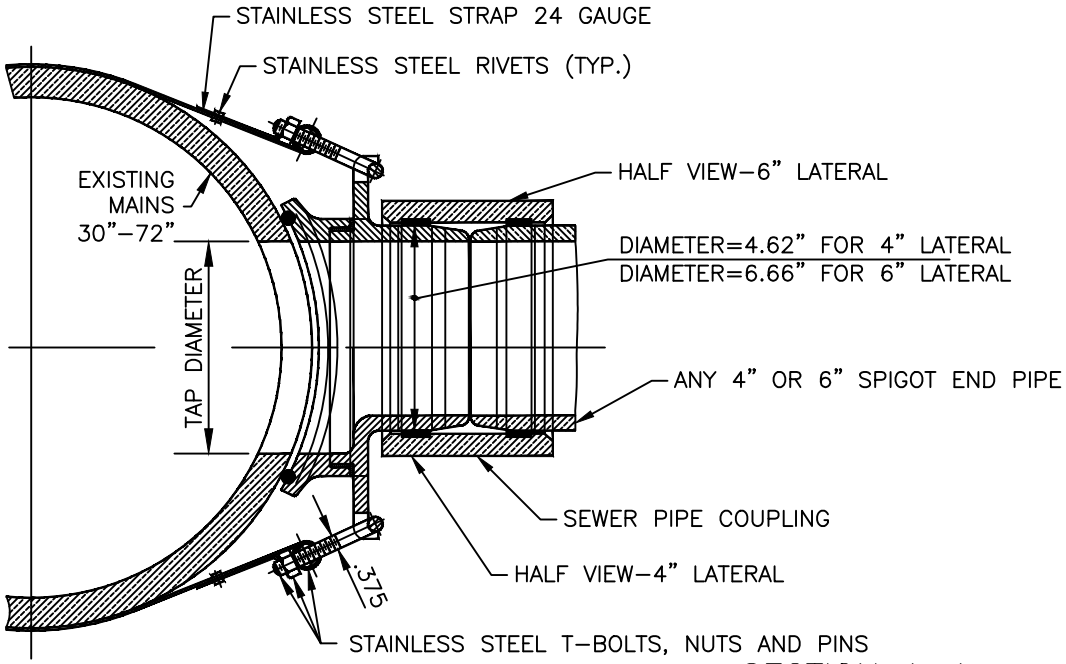
S-11.0

MARCH 2017



SECTION
NTS



SECTION A–A
NTS

NOTES:

1. TAPPING SADDLE TO BE SEALTITE TYPE "CS" AS SUPPLIED BY GENCO OR APPROVED EQUAL.
2. TAPPING SADDLE SHOULD BE SUPPORTED BY MIN. 6" CONCRETE ENCASEMENT
3. ELASTOMERIC COUPLING AS SUPPLIED BY FERNCO OR APPROVED EQUAL.
4. HOLE FOR SEWER CONNECTION TO BE MACHINE TAPPED ONLY.
5. ANGLE OF TAP TO BE DETERMINED IN THE FIELD.

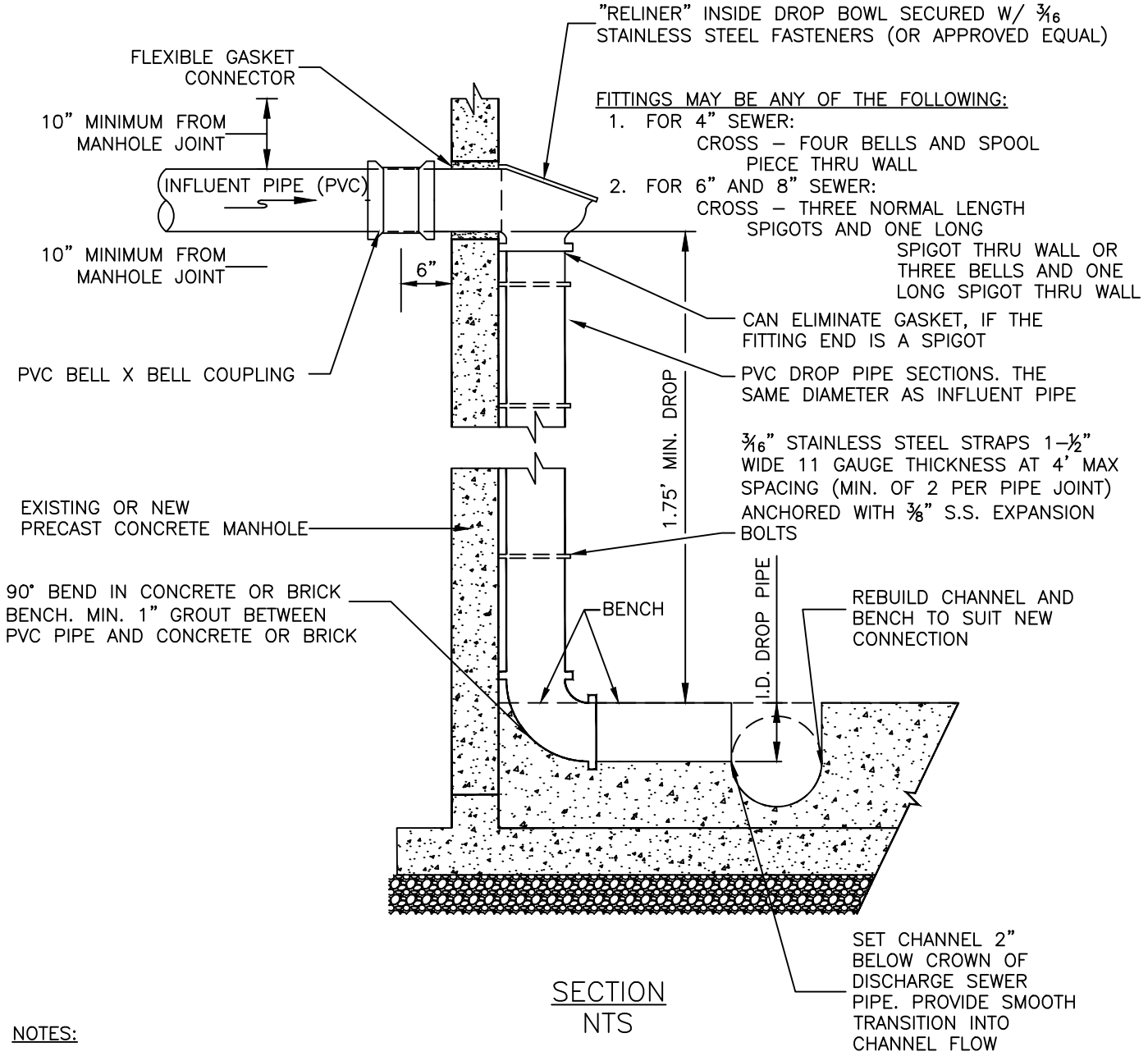
The City of Frederick Maryland

TAPPING SADDLE FOR 30" TO 72" SEWER MAINS

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-11.1

MARCH 2017



SECTION
NTS

NOTES:

1. ONLY ONE INSIDE DROP CONNECTION PER MANHOLE WILL BE ALLOWED, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
2. THE DROP FITTING SHALL NOT EXTEND INTO THE AREA THAT IS DEFINED BY THE PROJECTION OF THE MANHOLE ENTRANCE VERTICALLY DOWN TO THE MANHOLE BOTTOM. IF NECESSARY, MANHOLE FRAME, COVER, CONE SECTION, AND STEPS SHALL BE REMOVED AND PLACED TO ALLOW UNOBSTRUCTED ENTRY AND EXIT.
3. WHEN INSIDE DROP CONNECTION REPLACES EXISTING OUTSIDE DROP, PROVIDE MECHANICAL PLUG AND FILL ANNULAR SPACE WITH NON–SHINK GROUT.
4. INFLUENT PIPE SLOPE SHALL NOT EXCEED 5%
5. MAXIMUM SIZE OF INFLUENT PIPE IS 8"
6. ALL HARDWARE/FASTENERS SHALL BE 3/16 STAINLESS STEEL

The City of Frederick Maryland

INSIDE DROP MANHOLE CONNECTION

APPROVED: Zachary J. Kershner
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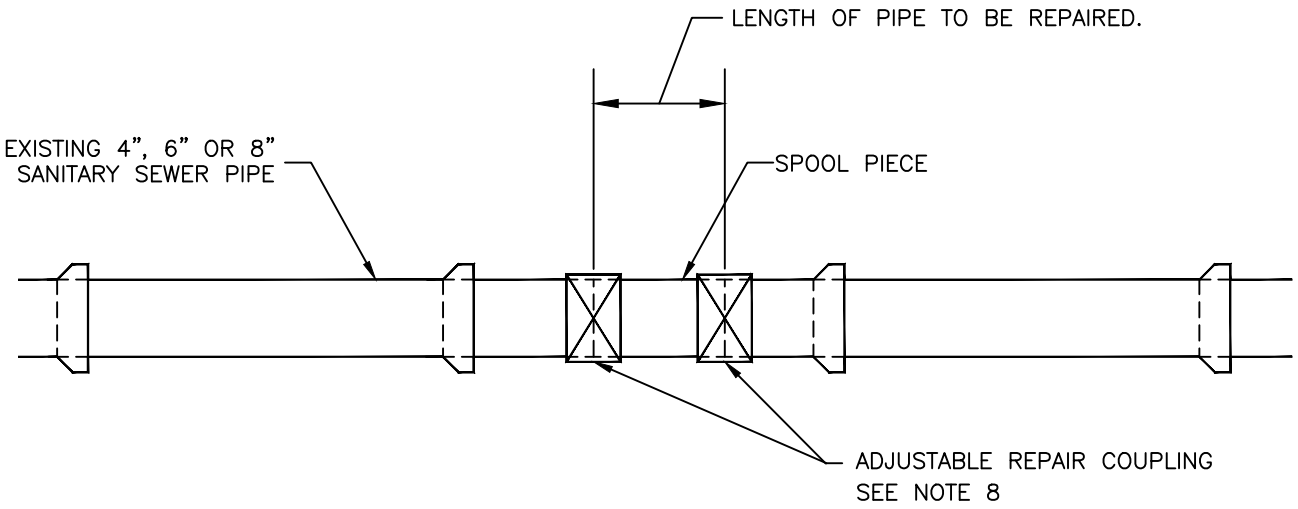
S-12.0

MARCH 2017



PROFILE
NTS

GENERAL PROCEDURE FOR REPAIR OF DAMAGED OR FAILED SEWER LINE:

1. REMOVE DAMAGED OR FAILED SECTION OF SEWER LINE TO SOLID PIPING AS NEEDED. INSPECTOR TO VERIFY CONDITION OF EXISTING PIPE.
2. CUT SPOOL PIECE ABOUT 1/2" SHORTER THAN OPENING IN SEWER LINE.
3. SLIDE ADJUSTABLE REPAIR COUPLING ONTO EACH END OF THE EXISTING SEWER LINE.
4. PLACE A PENCIL MARK 1/2 THE COUPLING WIDTH FROM EACH JOINT ON EXISTING PIPE ENDS.
5. USING THE PENCIL MARKS, CENTER A COUPLING OVER ONE JOINT AT A TIME AND TIGHTEN CLAMPS.
6. THE CLAMP BOLTS SHOULD BE TIGHTENED FIRST, AND THEN THE SHEAR RING.
7. AFTER ASSEMBLY, FIRMLY BUT CAREFULLY TAMP BEDDING UNDER THE EXPOSED SEWER LINE.
8. FOR ADJUSTABLE REPAIR COUPLINGS USE 300 SERIES TYPE 316 STAINLESS STEEL CLAMP PRODUCED BY "THE MISSION RUBBER COMPANY" OR APPROVED EQUAL.
9. FERNCOS SHOULD BE SUPPORTED BY MIN. 6" OF CONCRETE ENCASEMENT

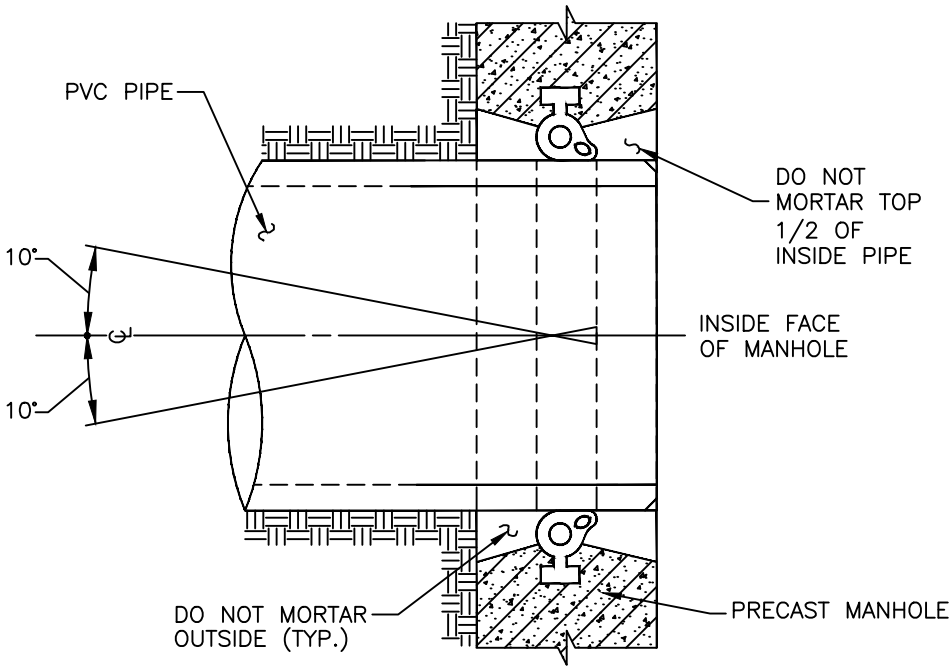
The City of Frederick Maryland

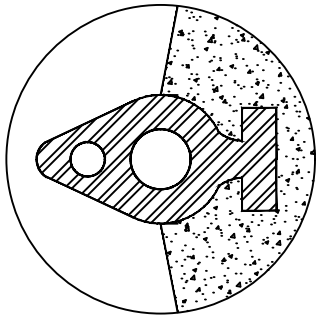
METHOD OF REPAIRING 4", 6" AND 8" SANITARY SEWER LINES

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-13.0

MARCH 2017





RUBBER GASKET
CROSS SECTION
BEFORE INSTALLATION

RUBBER GASKET CROSS SECTION
AFTER INSTALLATION
NTS

NOTES:.

1. PRECAST MANHOLES ARE TO BE FURNISHED WITH A–LOK GASKETS OR APPROVED EQUAL.
2. FLEXIBLE PVC ADAPTER SHALL BE STRETCHED OVER PLASTIC PIPE AT CENTERLINE OF MANHOLE WALL. THE ADAPTER SHALL BE DESIGNED TO PROVIDE A WATERTIGHT SEAL AROUND THE PLASTIC PIPE.
3. A–LOK GASKET OR APPROVED EQUAL PER ASTM RUBBER GASKET SPECS C443, CAST INTEGRALLY IN MANHOLE WALL AND LOCATED AS REQUIRED. JOINT ALLOWS 10° OMNIDIRECTIONAL DEFLECTION FROM PERPENDICULAR
4. BECAUSE OF THE RUBBER GASKET'S ABILITY TO ENSURE A FLEXIBLE, WATERTIGHT JOINT, IT IS RECOMMENDED THAT NO MORTAR BE PLACED AROUND THE CONNECTOR AT ALL ON THE OUTSIDE OF THE STRUCTURE AND THAT NO MORTAR BE PLACED AROUND THE TOP HALF OF THE CONNECTOR ON THE INSIDE WHEN COMPLETING THE INVERT WORK. THE USE OF MORTAR IN EITHER OF THESE AREAS WOULD ELIMINATE THE FLEXIBILITY FOR WHICH THE CONNECTOR IS DESIGNED AND CAUSE PROBLEMS OF SHEAR.

The City of Frederick Maryland

RUBBER GASKET

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

S-14.0

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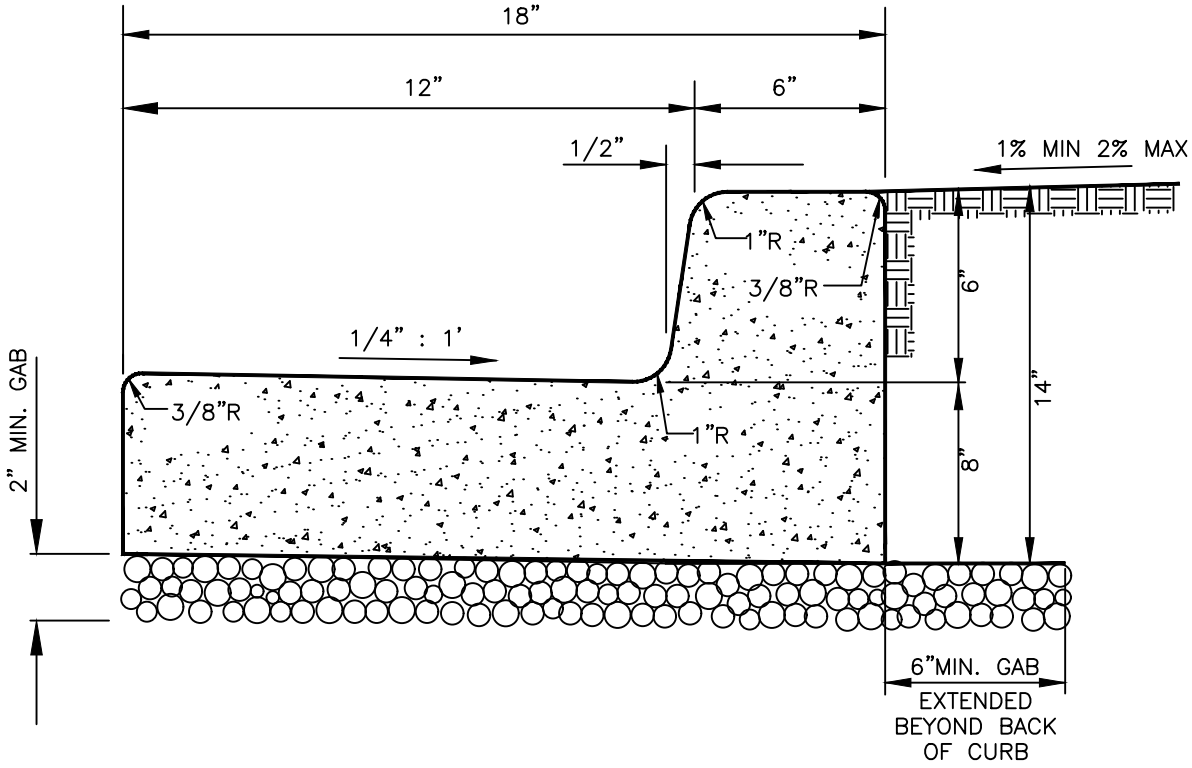
STREET DETAILS



FREDERICK CITY COMBINATION CURB & GUTTER
NTS

NOTES:

1. MSHA MIX NO. 3 CONCRETE.
2. STEEL TROWEL AND BRUSH FINISH.
3. CONCRETE SHALL BE SPRAYED WITH LIQUID CURING COMPOUND AS SOON AS FREE WATER HAS DISAPPEARED FROM THE SURFACE.
4. 2" MINIMUM GAB SHALL BE USED AND EXTEND 6" BEYOND BACK OF CURB
5. CONSTRUCTION JOINTS TO BE PLACED IN ACCORDANCE WITH MSHA SPECIFICATIONS.
6. MATCH STONE DEPTH WITH PAVING SECTION IN ORDER TO MAINTAIN 2" STONE OR MAINTAIN UNIFORM PAVEMENT SUBGRADE
7. FORMS SHALL BE STEEL FORMS WITH THE EXCEPTION OF APPROVED FLEXIBLE FORMS FOR RADIAL FORMATION.

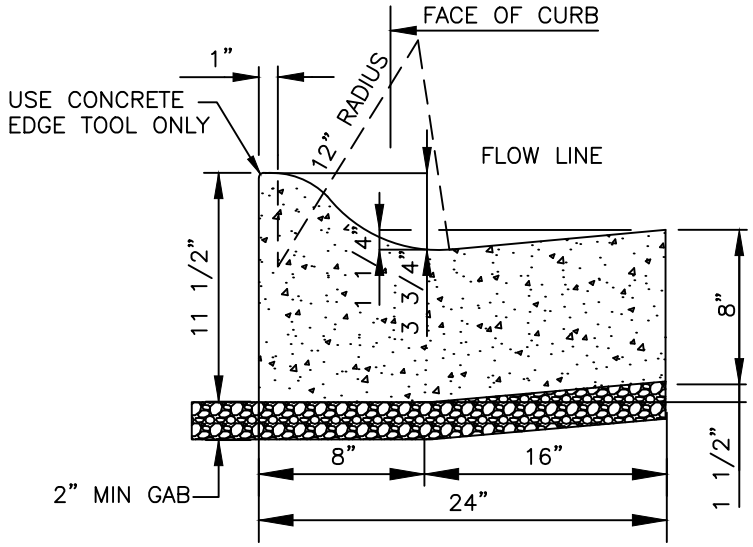
The City of Frederick Maryland

COMBINATION CURB & GUTTER

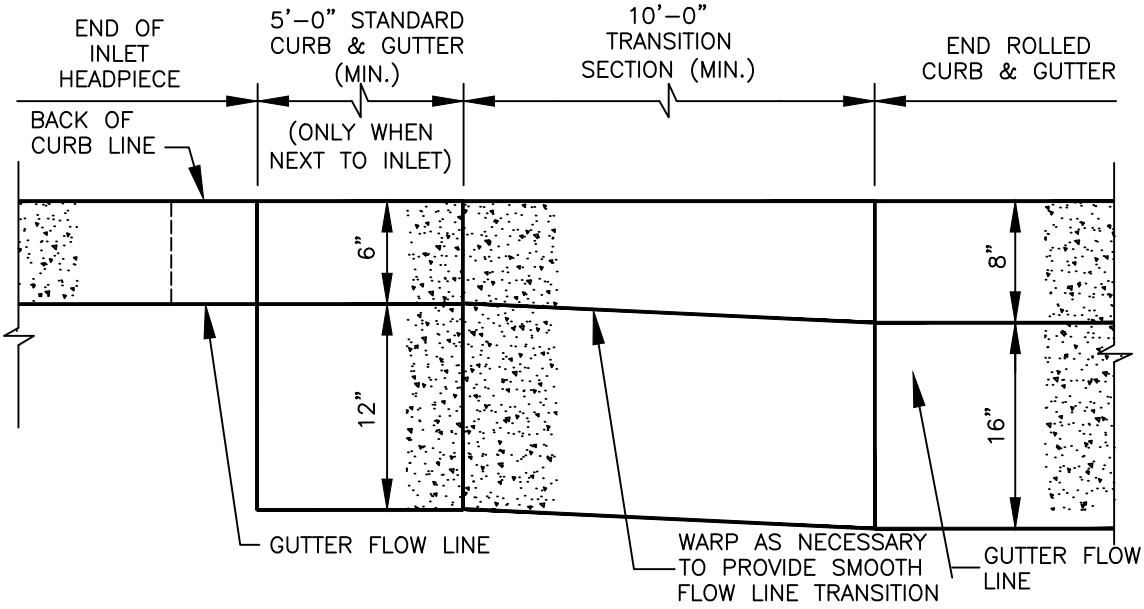
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-1.0

MARCH 2017



MODIFIED COMBINATION
CURB AND GUTTER
NTS



TRANSITION STANDARD CURB AND GUTTER
TO ROLLED CURB AND GUTTER
NTS

NOTES:

1. MSHA MIX NO. 3 CONCRETE.
   1.1. IN HISTORIC DISTRICT;
   CONCRETE SHALL BE FREDERICK CITY HISTORIC MIX (MSHA MIX NO. 3 W/O PORTLAND CEMENT SUBSTITUTES)
2. STEEL TROWEL AND BRUSH FINISH.
3. CONCRETE SHALL BE SPRAYED WITH LIQUID CURING COMPOUND AS SOON AS FREE WATER HAS DISAPPEARED FROM THE SURFACE.
4. 2" MINIMUM GAB SHALL BE USED AND EXTEND 6" BEYOND BACK OF CURB
5. CONSTRUCTION JOINTS TO BE PLACED IN ACCORDANCE WITH MSHA SPECIFICATIONS.
6. MATCH STONE DEPTH WITH PAVING SECTION IN ORDER TO MAINTAIN 2" STONE OR MAINTAIN UNIFORM PAVEMENT SUBGRADE
7. FORMS SHALL BE STEEL FORMS WITH THE EXCEPTION OF APPROVED FLEXIBLE FORMS FOR RADIAL FORMATION.

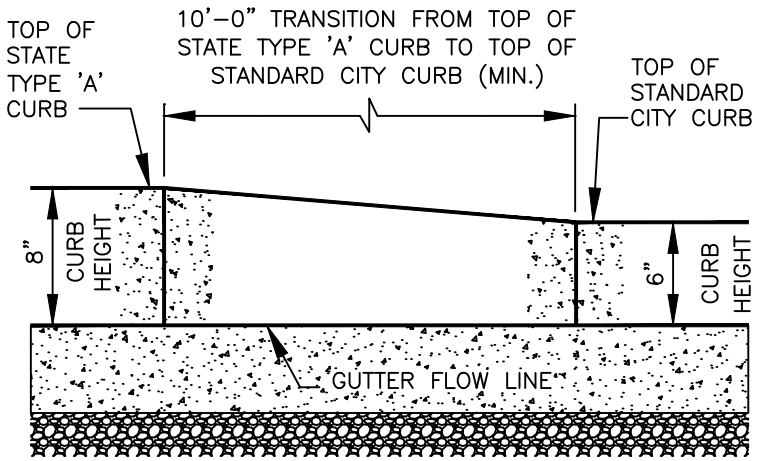
The City of Frederick Maryland

ROLLED CURB & GUTTER

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

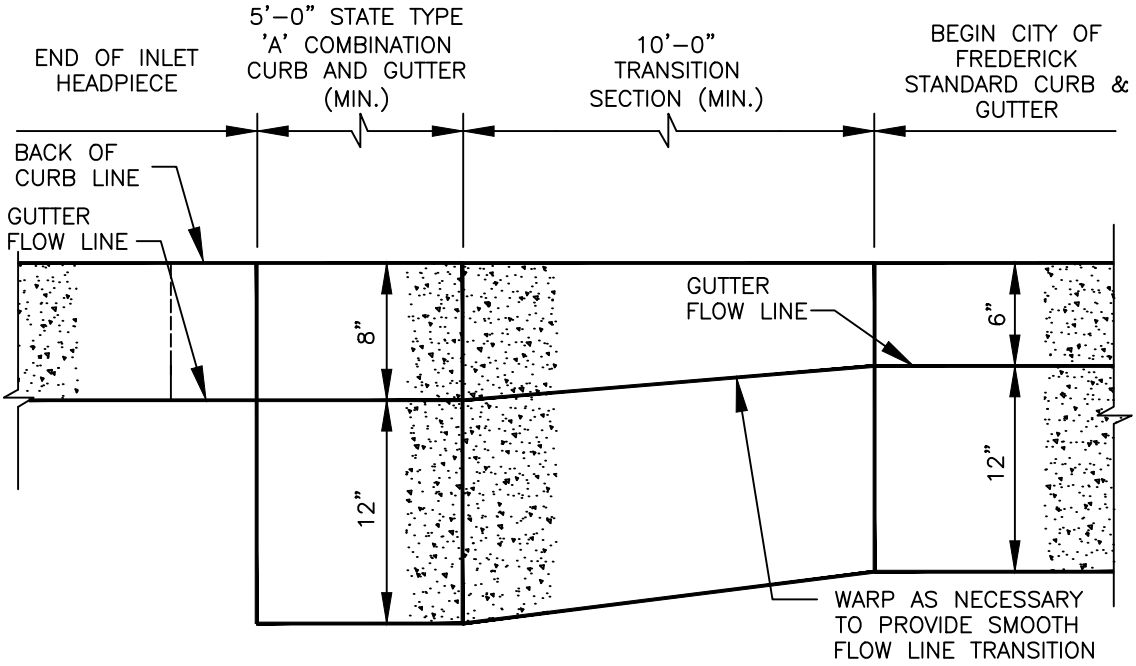
ST-1.1

MARCH 2017



TRANSITION FROM STATE TYPE 'A'
CURB TO STANDARD CITY CURB

NTS



TRANSITION FROM STATE TYPE 'A' CURB AND GUTTER
TO CITY OF FREDERICK STANDARD CURB AND GUTTER

NTS

NOTES:

1. MSHA MIX NO. 3 CONCRETE.
2. STEEL TROWEL AND BRUSH FINISH.
3. CONCRETE SHALL BE SPRAYED WITH LIQUID CURING COMPOUND AS SOON AS FREE WATER HAS DISAPPEARED FROM THE SURFACE.
4. 4" MINIMUM GAB SHALL BE USED AND EXTEND 6" BEYOND BACK OF CURB
5. CONSTRUCTION JOINTS TO BE PLACED IN ACCORDANCE WITH MSHA SPECIFICATIONS.
6. MATCH STONE DEPTH WITH PAVING SECTION IN ORDER TO MAINTAIN 2" STONE OR MAINTAIN UNIFORM PAVEMENT SUBGRADE
7. FORMS SHALL BE STEEL FORMS WITH THE EXCEPTION OF APPROVED FLEXIBLE FORMS FOR RADIAL FORMATION.

The City of Frederick Maryland

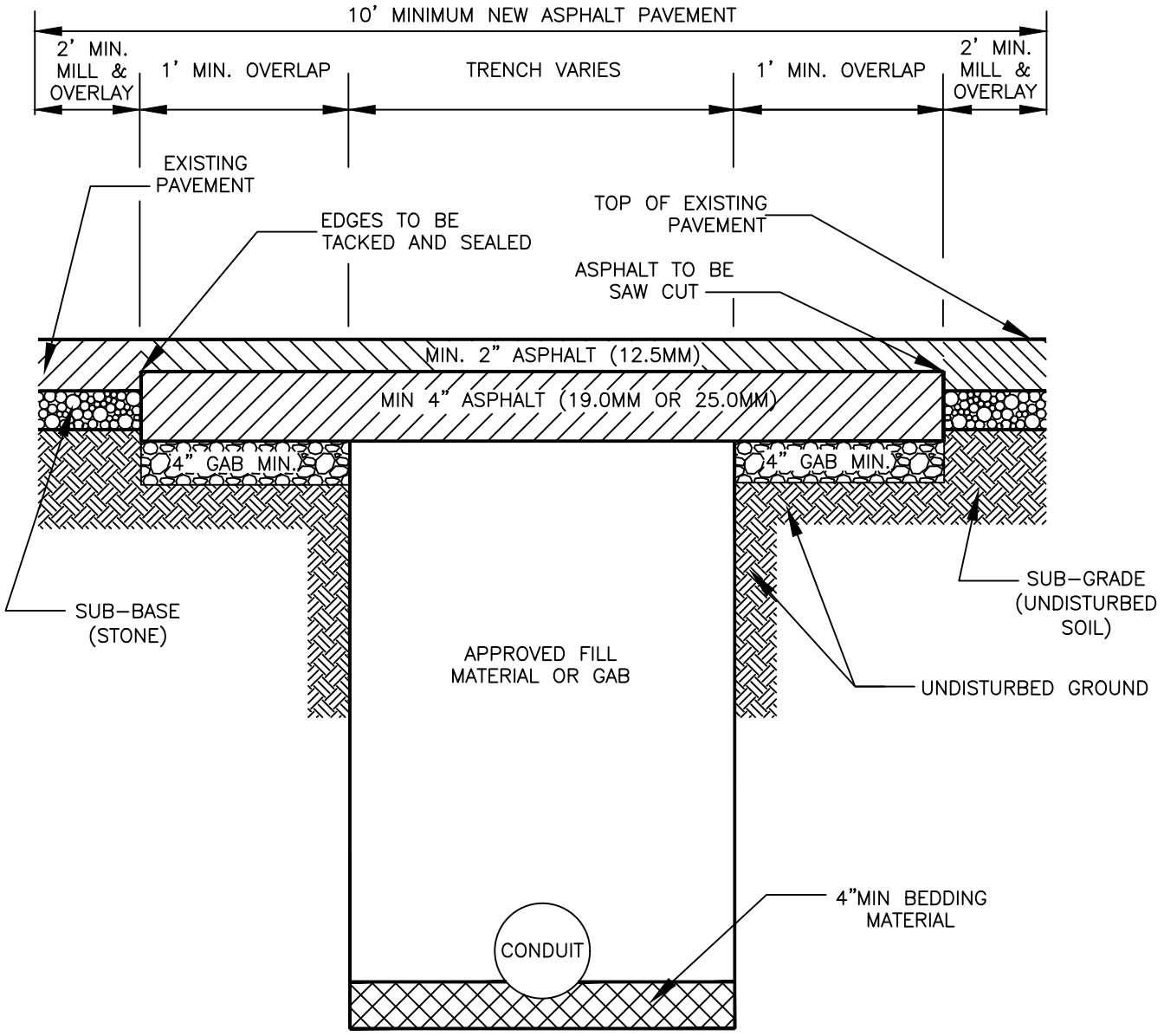
CURB & GUTTER TRANSITION FROM STATE HIGHWAY TYPE `A' TO CITY CURB & GUTTER

APPROVED: Zachary J. Kershner

DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-1.2

MARCH 2017



TYPICAL TRENCH PATCH ASPHALT PATCH
FOR ASPHALT STREETS

NTS

NOTES:

1. LIMITS OF MILL AND OVERLAY TO BE DETERMINED BY CITY INSPECTOR BASED ON FIELD CONDITIONS.
2. MATCH EXISTING PAVEMENT SECTION OR PROVIDE MINIMUM 6" ASPHALT AND 4" MINIMUM GAB PER DETAIL, WHICHEVER IS GREATER

The City of Frederick Maryland

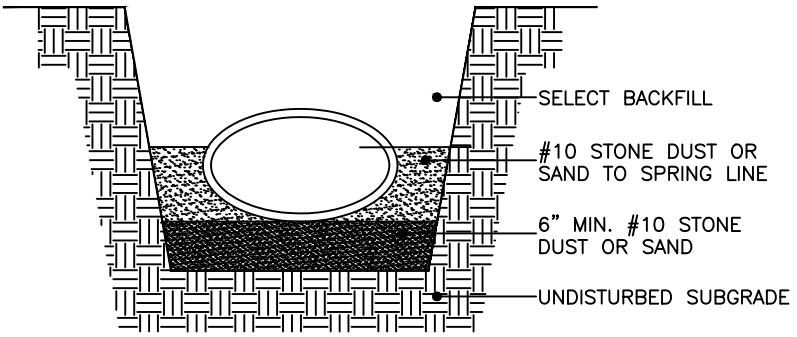
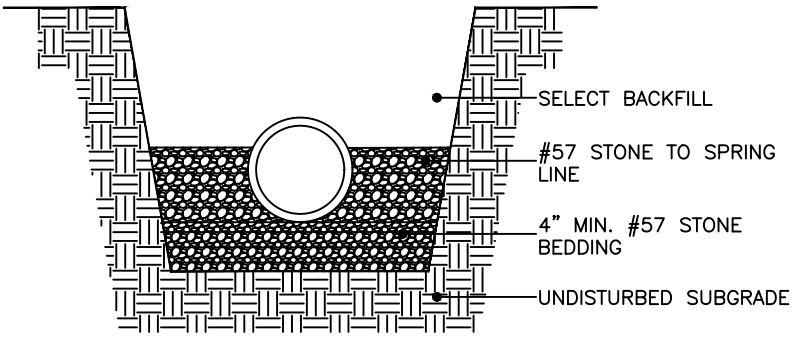
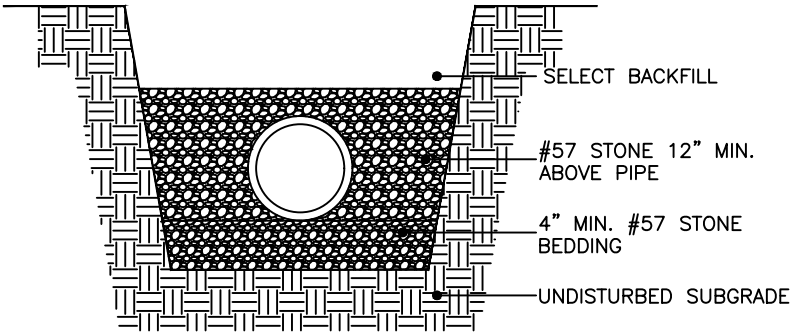
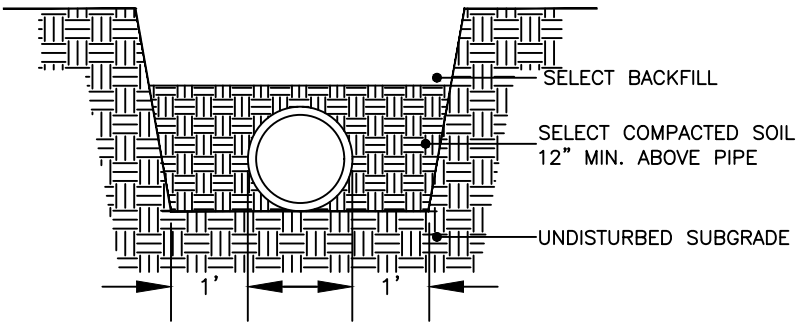
METHOD OF CUTTING & REPAIRING STREET OPENINGS

APPROVED: _____

DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-2.0

MARCH 2017

TYPE	MATERIALS
STORM DRAIN ELIPTICAL PIPE	
STORM DRAIN ROUND PIPE	
SEWER SDR 26 PIPE	
WATER DIP	

NOTES:

1. SELECT BACKFILL SHALL BE MINIMUM DEPTH REQUIRED BY CITY STANDARD DETAILS AND SPECIFICATIONS.

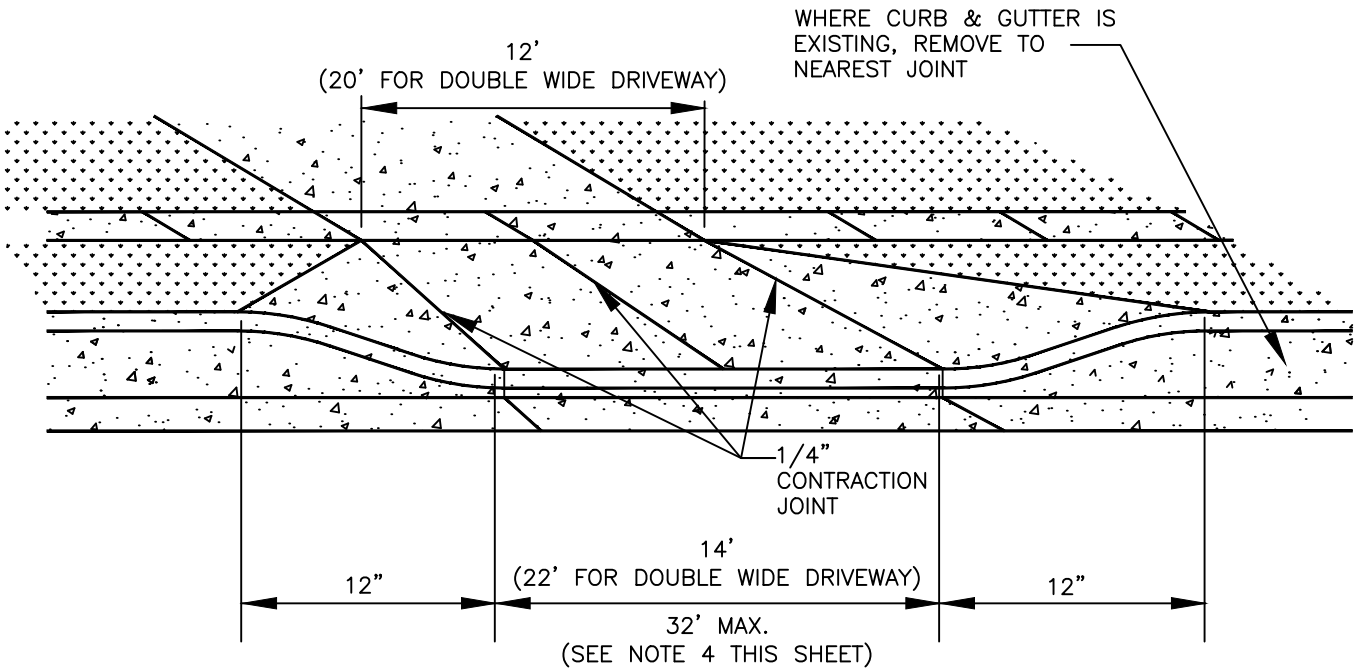
The City of Frederick Maryland

BACKFILL IN CITY RIGHT OF WAY

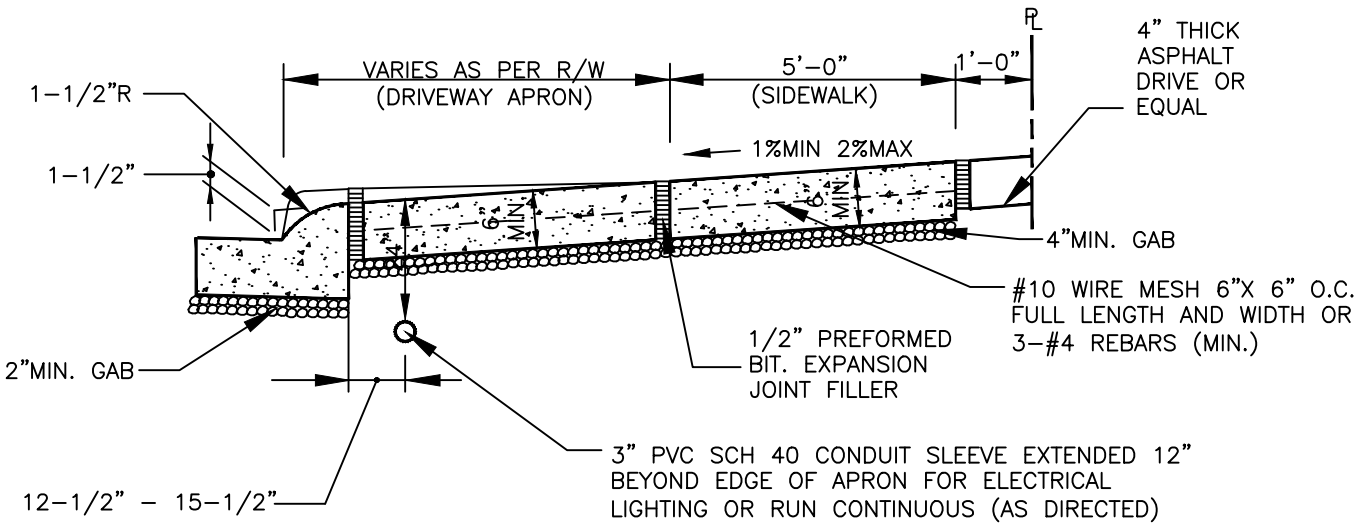
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-2.1

MARCH 2017



DRIVEWAY & CURB DETAIL
NTS



TYPICAL SECTION
NTS

NOTES:

1. SCORE 1/4" DUMMY CONTRACTION JOINTS AT 4'-0" INTERVALS.
2. CONSTRUCT 1/2" BITUMINOUS EXPANSION JOINTS AT 20'-0" (MAX.) INTERVALS.
3. CONCRETE SHALL BE SPRAYED WITH LIQUID CURING COMPOUND AS SOON AS FREE WATER HAS DISAPPEARED FROM THE SURFACE.
4. 32' MAXIMUM WIDTH IS SUBJECT TO APPROVAL ON A CASE BY CASE BASIS AND FOR COMMERCIAL USE.
5. CONCRETE TO BE MSHA MIX NO. 3.

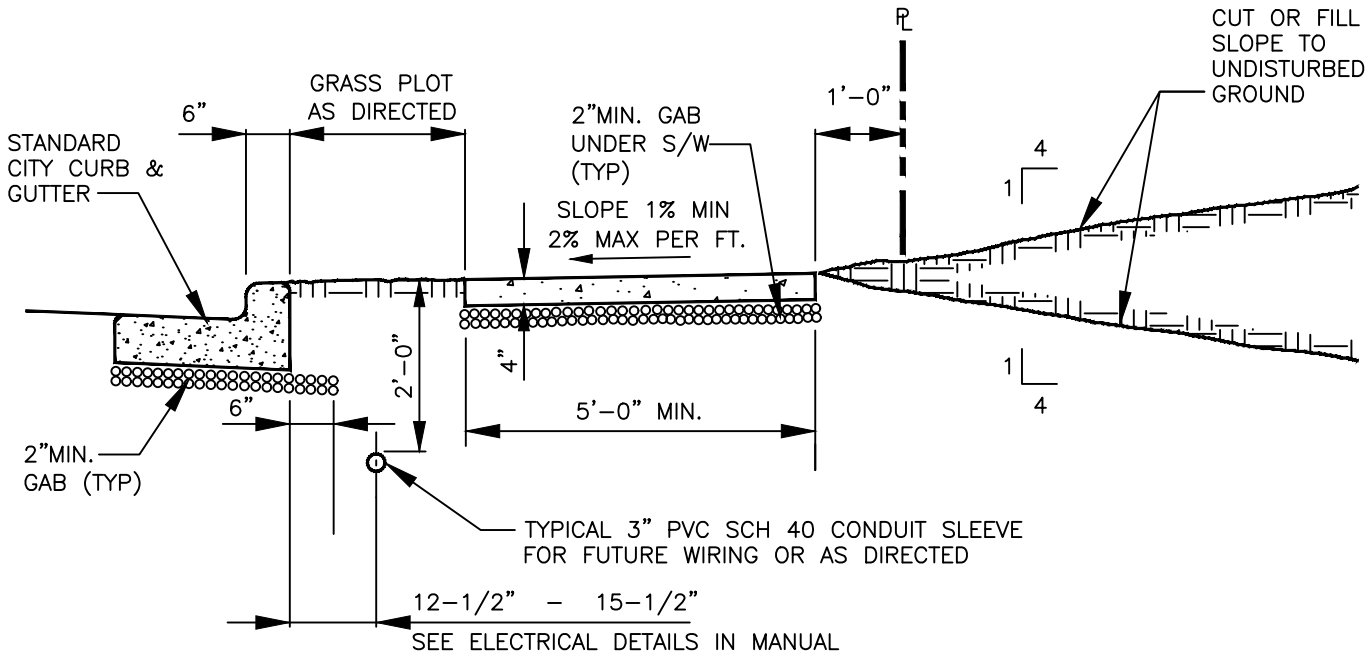
The City of Frederick Maryland

TYPICAL DRIVEWAY APRON FOR SINGLE FAMILY & COMMERCIAL ENTRANCES

APPROVED: Zachary J. Kershner
DIRECTOR-DEPARTMENT PUBLIC WORKS

ST-3.0

MARCH 2017



TYPICAL SIDEWALK DETAIL
NTS

NOTES:

1. CONCRETE SHALL BE MSHA MIX NO. 3 CONCRETE AS DESIGNATED BY THE MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS.
2. SIDEWALKS TO BE SCRIBED IN 5' MAXIMUM LENGTHS AND BRUSH FINISHED, EXPANSION JOINTS TO BE SPACED EVERY 30 FEET AND BETWEEN CURB AND SIDEWALK WHERE ADJACENT.
3. ONLY STEEL FORMS TO BE USED WHILE PLACING SIDEWALK FOR STRAIGHT SECTIONS AND RADII GREATER THAN TWO HUNDRED (200) FEET.
4. CONCRETE SHALL BE SPRAYED WITH LIQUID CURING COMPOUND AS SOON AS FREE WATER HAS DISAPPEARED FROM THE SURFACE.

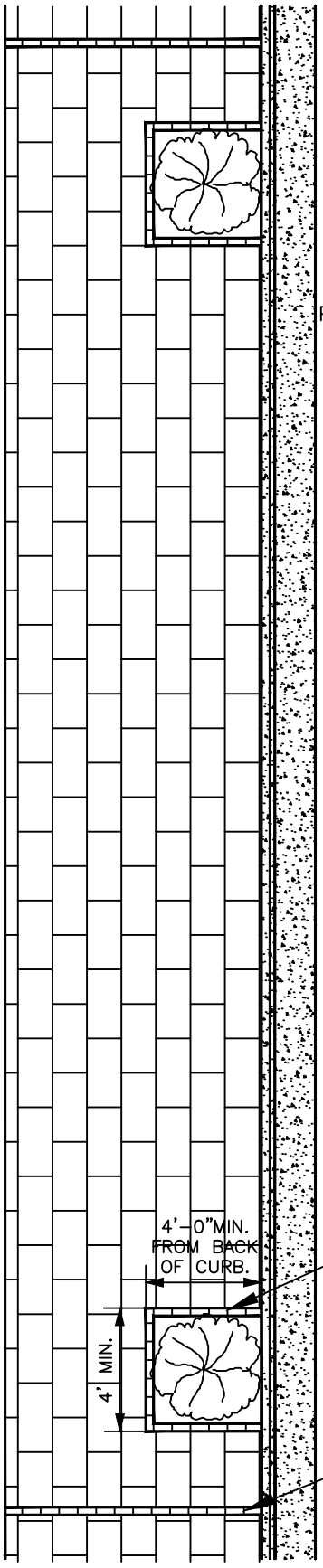
The City of Frederick Maryland

TYPICAL SIDEWALK INSTALLATION

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

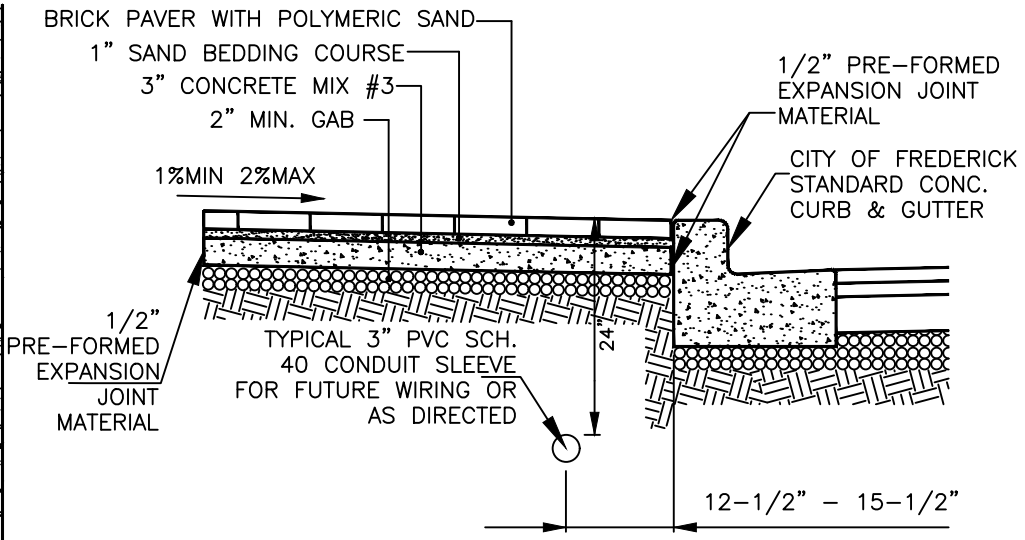
ST-4.0

MARCH 2017

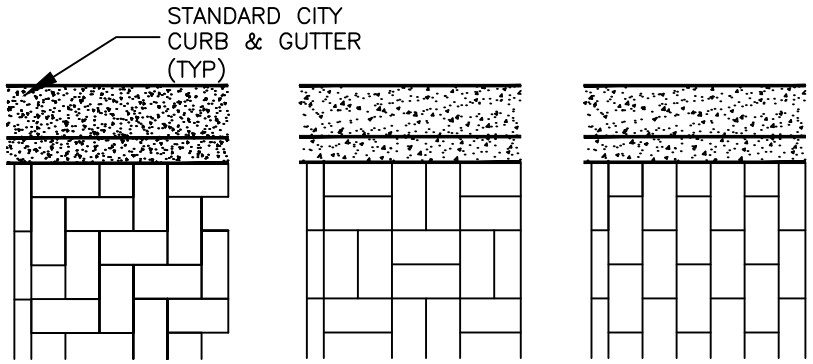


BRICK BORDER, (STANDARD PAVING BRICKS) AROUND TREE AREA OR AS DIRECTED

BRICK BORDER (STANDARD PAVING BRICKS) PROPERTY LINE



TYPICAL SECTION
NTS



PATTERN "A" HERRINGBONE

PATTERN "B" BASKET WEAVE

PATTERN "C" RUNNING BOND

NOTES:

1. STANDARD PAVING BRICK 2-1/4"X 3-5/8"X 8" NO. 213Y BY GLEN GARY OR APPROVED EQUAL.
2. EXPANSION JOINTS IN THE 3" CONCRETE UNDERLAYMENT TO BE SPACED EVERY 30' AND BETWEEN CURB AND SIDEWALK WHERE ADJACENT.
3. TREE ARE VARIES BASED ON SIZE AND TREE SPECIES, CONTACT CITY OF FREDERICK ARBORIST FOR CORRECT SIZE AND PLACEMENT.
4. ALL TREES IN BRICK SIDEWALK TO HAVE A METAL FRAME TO KEEP BRICK BOARDER IN PLACE
5. STREET LIGHT PLACEMENT SHOULD BE BASED ON PHOTOMETRIC READING.

The City of Frederick Maryland

BRICK SIDEWALK DETAIL

ST-5.0

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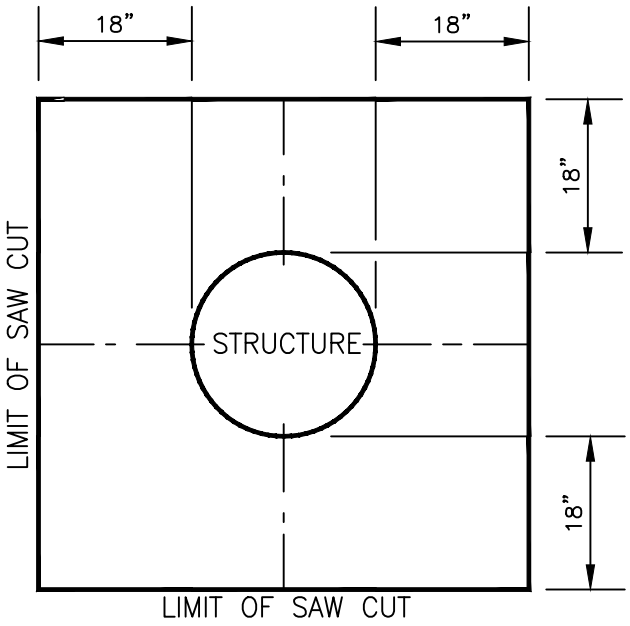
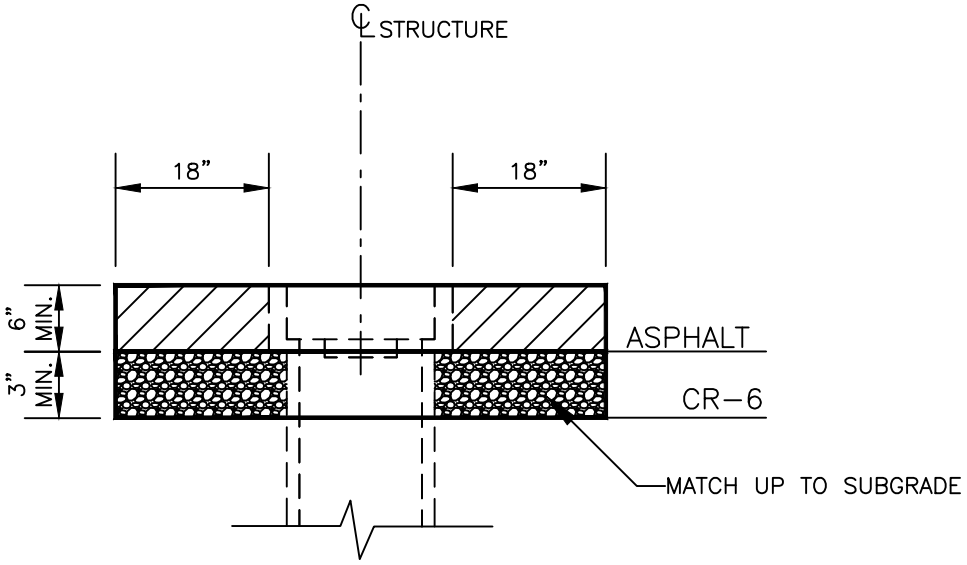
DIRECTOR-DEPARTMENT PUBLIC WORKS

MARCH 2017





NOTES:

1. PRIOR TO PLACING ASPHALT, SUB–GRADE SHALL BE FIRMLY COMPACTED WITH NEATLY CUT EDGES.
2. ALL PUBLIC UTILITY STRUCTURES ARE TO BE ADJUSTED BY THE RESPECTIVE PUBLIC UTILITY COMPANIES IN ADVANCE OF ALL SURFACING WORK IN THE CONTRACT.
4. ADJUSTMENT OF MANHOLES, VALVES, ETC. TO BE AS PER SECTION 02500–3 PARAGRAPH 'F' OF THE CITY OF FREDERICK STANDARD SPECIFICATIONS.

The City of Frederick Maryland

UTILITY STRUCTURE ADJUSTMENT DETAIL (FOR EXISTING STRUCTURES IN R.O.W.)

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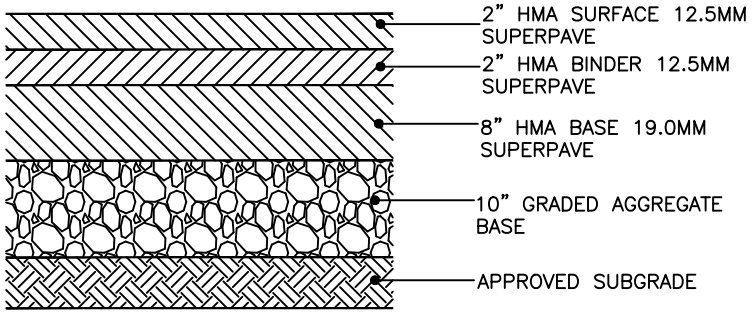
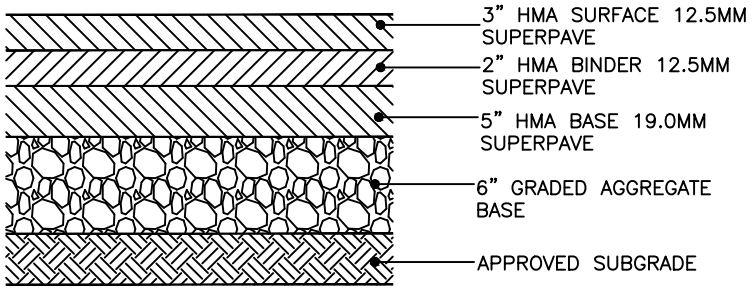
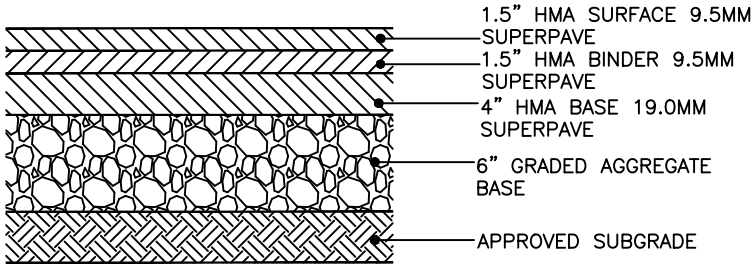
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-6.0

MARCH 2017

TYPE	MATERIALS
PAVEMENT–1 ATERIAL	
PAVEMENT–2 COLLECTOR	
PAVEMENT–3 LOCAL/ALLEY	

NOTES:

1. BINDER FOR ALL PAVING SECTIONS SHALL BE PG 64–22.
2. PAVING SECTIONS MAY ALSO BE DESIGNED BY GEOTECH ENGINEER BASED ON CBR VALUE OF ON SITE SOILS. REPORT SHALL BE PROVIDED TO THE CITY ENGINEER FOR APPROVAL.
3. ALL ALLEYS PROVIDING CITY TRASH COLLECTION SHALL BE DESIGNED USING THE PAVEMENT–3, LOCAL/ ALLEY PAVING SECTION.
4. ALL SURFACE SHALL BE VIRGIN MIX

The City of Frederick Maryland

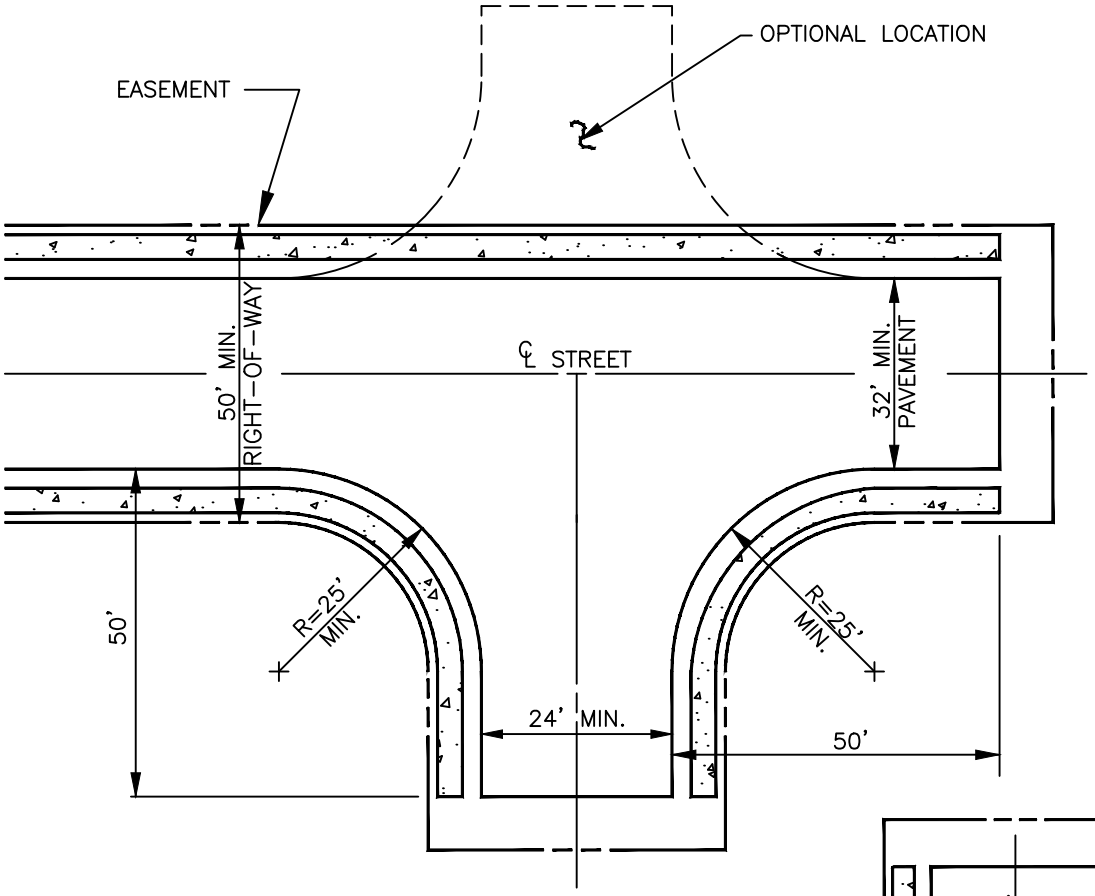
PAVEMENT SECTIONS

APPROVED: _____

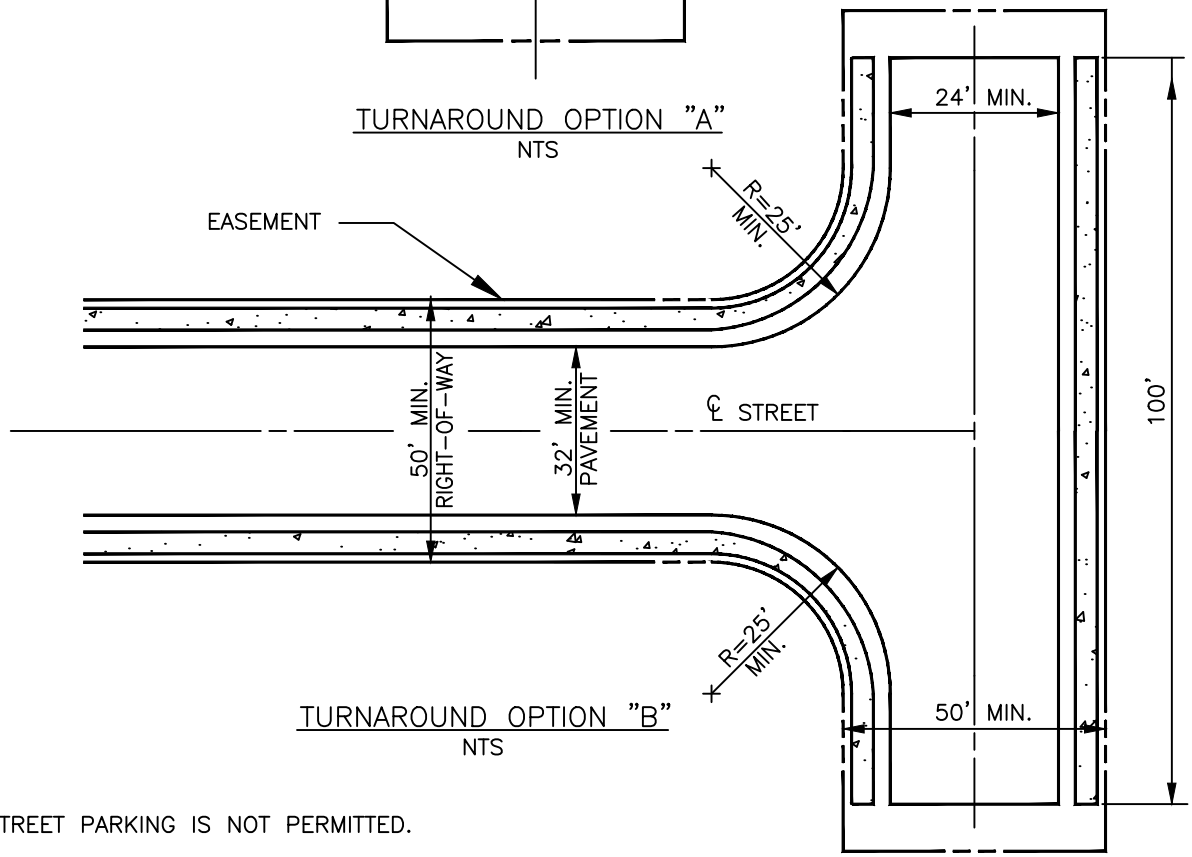
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-7.0

MARCH 2017



TURNAROUND OPTION "A"
NTS



TURNAROUND OPTION "B"
NTS

NOTES:

1. ON-STREET PARKING IS NOT PERMITTED.
2. SIDEWALKS TO BE INSTALLED AT THE DISCRETION OF THE CITY ENGINEER.
3. TEMPORARY TURNAROUNDS ARE PERMITTED FOR A DURATION OF TWO (2) YEARS FROM DATE OF APPROVAL.

The City of Frederick Maryland

TEMPORARY "T" TURNAROUND

ST-8.0

APPROVED: Zachary J. Kershner
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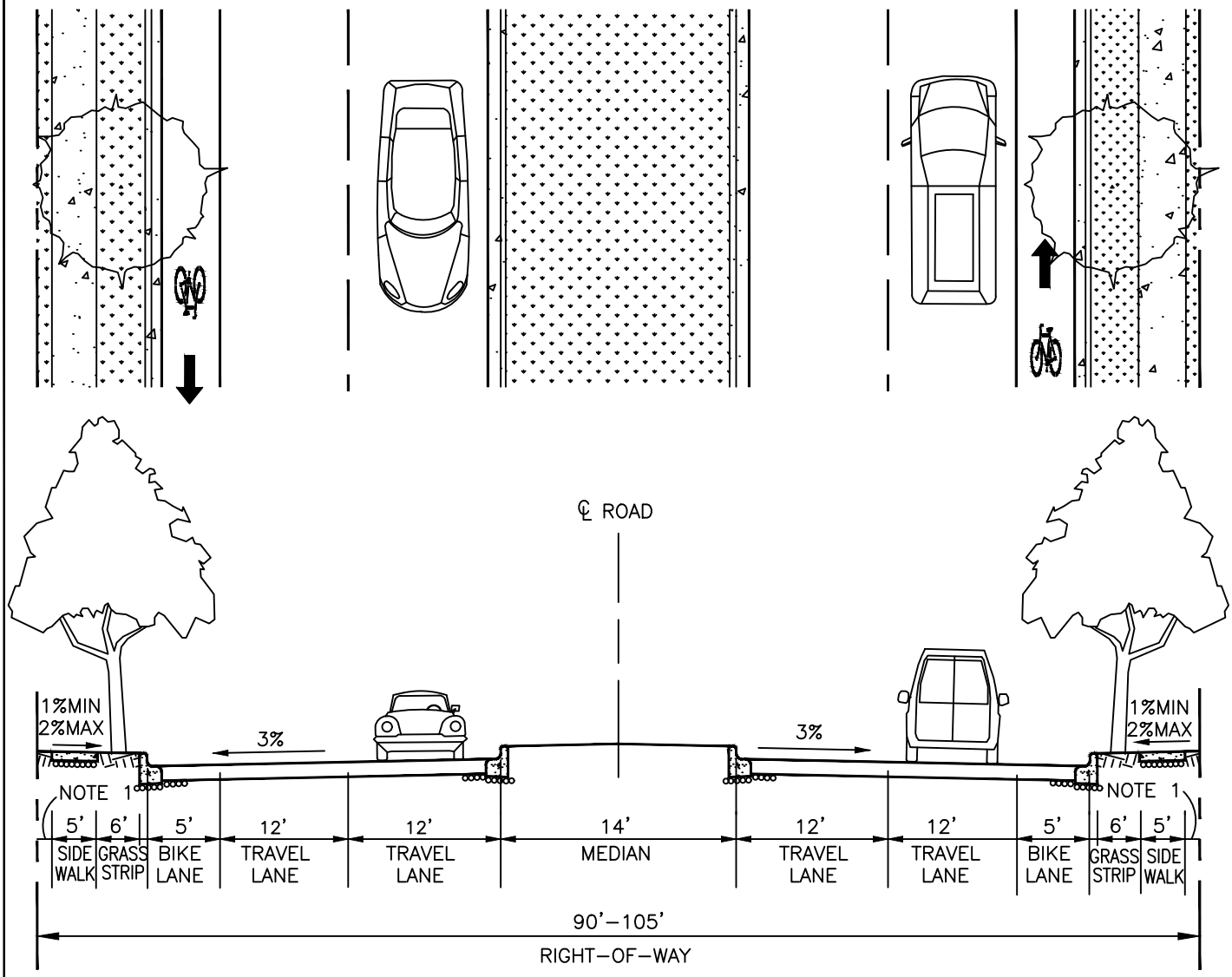
MARCH 2017



4 LANE MEDIAN DIVIDED STREET

NTS

NOTES:

1. AREA NEEDED FROM BACK OF SIDEWALK TO THE EDGE OF THE CITY RIGHT–OF–WAY VARIES FROM 2' TO 4.5' FOR EACH SIDE OF ROADWAY BASED ON MINIMUM REQUIRED RIGHT–OF–WAY WIDTHS.
2. FOR ALL INTERSECTIONS OF ARTERIALS, LEFT TURN LANES AND RIGHT TURN LANES SHALL BE PROVIDED. ACCELERATION LANES SHALL BE PROVIDED AS DIRECTED BY CITY ENGINEER.
3. MINIMUM INTERSECTION RADIUS FOR ARTERIAL SHALL BE 40' AND FOR COLLECTOR SHALL BE 50'.
4. MODIFICATIONS TO ANY DETAILS SHALL NOT BE ALLOWED WITHOUT APPROVAL OF CITY ENGINEER.
5. FOR STREET TREE, SIDEWALK, CURB & GUTTER AND PAVEMENT DETAILS, SEE LANDSCAPING AND STREET DETAIL SECTIONS IN LATEST CITY OF FREDERICK MANUAL.
6. ALL BIKE/PED LANE SIGNAGE, DELINEATION AND MARKINGS SHALL BE IN ACCORDANCE WITH THE NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS (NACTO) LATEST EDITIONS.
7. NO PARKING PERMITTED.

The City of Frederick Maryland

ARTERIAL
4 LANE MEDIAN DIVIDED STREET

ST-9.0

APPROVED: _____
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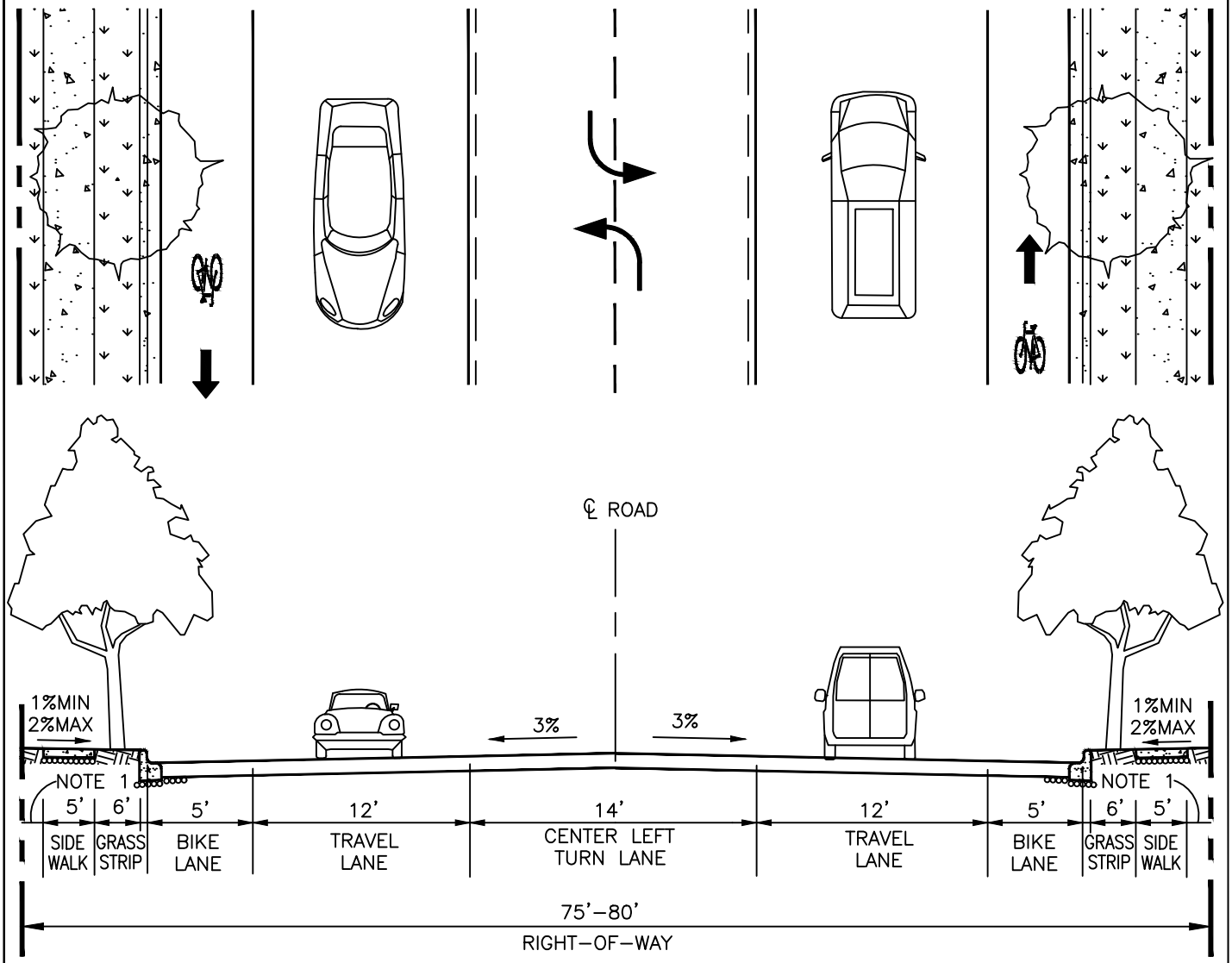


2 LANE STREET WITH CENTER LEFT TURN LANE

NTS

NOTES:

1. AREA NEEDED FROM BACK OF SIDEWALK TO THE EDGE OF THE CITY RIGHT–OF–WAY VARIES FROM 2' TO 4.5' FOR EACH SIDE OF ROADWAY BASED ON MINIMUM REQUIRED RIGHT–OF–WAY WIDTHS.
2. FOR ALL INTERSECTIONS OF URBAN PRINCIPAL ARTERIALS WITH OTHER URBAN PRINCIPAL OR MINOR ARTERIALS, LEFT TURN LANES AND RIGHT TURN LANES SHALL BE PROVIDED. ACCELERATION LANES SHALL BE PROVIDED AS DIRECTED BY CITY ENGINEER.
3. MINIMUM INTERSECTION RADIUS FOR URBAN COLLECTOR SHALL BE 34' AND FOR URBAN MINOR ARTERIAL SHALL BE 40'.
4. MODIFICATIONS TO ANY DETAILS SHALL BE DONE WITH THE APPROVAL OF CITY ENGINEER.
5. FOR STREET TREE, SIDEWALK, CURB & GUTTER AND PAVEMENT DETAILS, SEE LANDSCAPING AND STREET DETAIL SECTIONS IN LATEST CITY OF FREDERICK MANUAL.
6. ALL BIKE/PED LANE SIGNAGE, DELINEATION AND MARKINGS SHALL BE IN ACCORDANCE WITH THE NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS (NACTO) LATEST EDITIONS.
7. ON–STREET PARKING IS NOT PERMITTED.

The City of Frederick Maryland

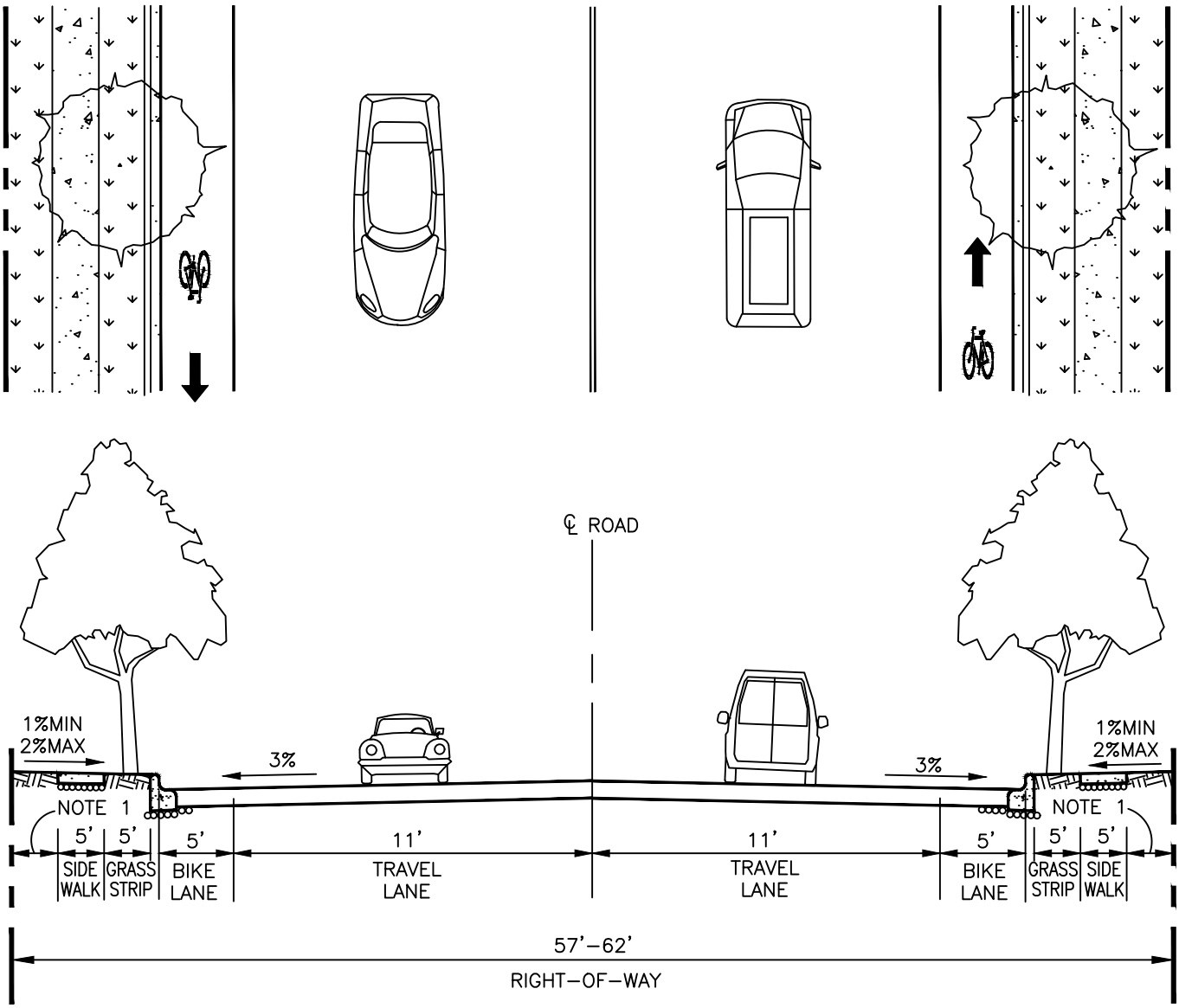
COLLECTOR/ MINOR ARTERIAL
2 LANES W/ CENTER LEFT TURN LANE

APPROVED: Zachary J. Kershner

DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-10.0

MARCH 2017



2 LANE STREET WITH BIKE LANE

NTS

NOTES:

1. AREA NEEDED FROM BACK OF SIDEWALK TO THE EDGE OF THE CITY RIGHT–OF–WAY VARIES FROM 2' TO 4.5' FOR EACH SIDE OF ROADWAY BASED ON MINIMUM REQUIRED RIGHT–OF–WAY WIDTHS.
2. MINIMUM INTERSECTION RADIUS FOR URBAN COLLECTORS AND URBAN LOCALS SHALL BE 34'.
3. MODIFICATIONS TO ANY DETAILS SHALL BE DONE WITH THE APPROVAL OF CITY ENGINEER.
4. FOR STREET TREE, SIDEWALK, CURB & GUTTER AND PAVEMENT DETAILS, SEE LANDSCAPING AND STREET DETAIL SECTIONS IN LATEST CITY OF FREDERICK MANUAL.
5. ALL BIKE/PED LANE SIGNAGE, DELINEATION AND MARKINGS SHALL BE IN ACCORDANCE WITH THE NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS (NACTO) LATEST EDITIONS.
6. ON–STREET PARKING IS NOT PERMITTED.

The City of Frederick Maryland

COLLECTOR 2 LANE STREET WITH BIKE LANE AND NO PARKING

ST-10.1

APPROVED: Zachary J. Kershner

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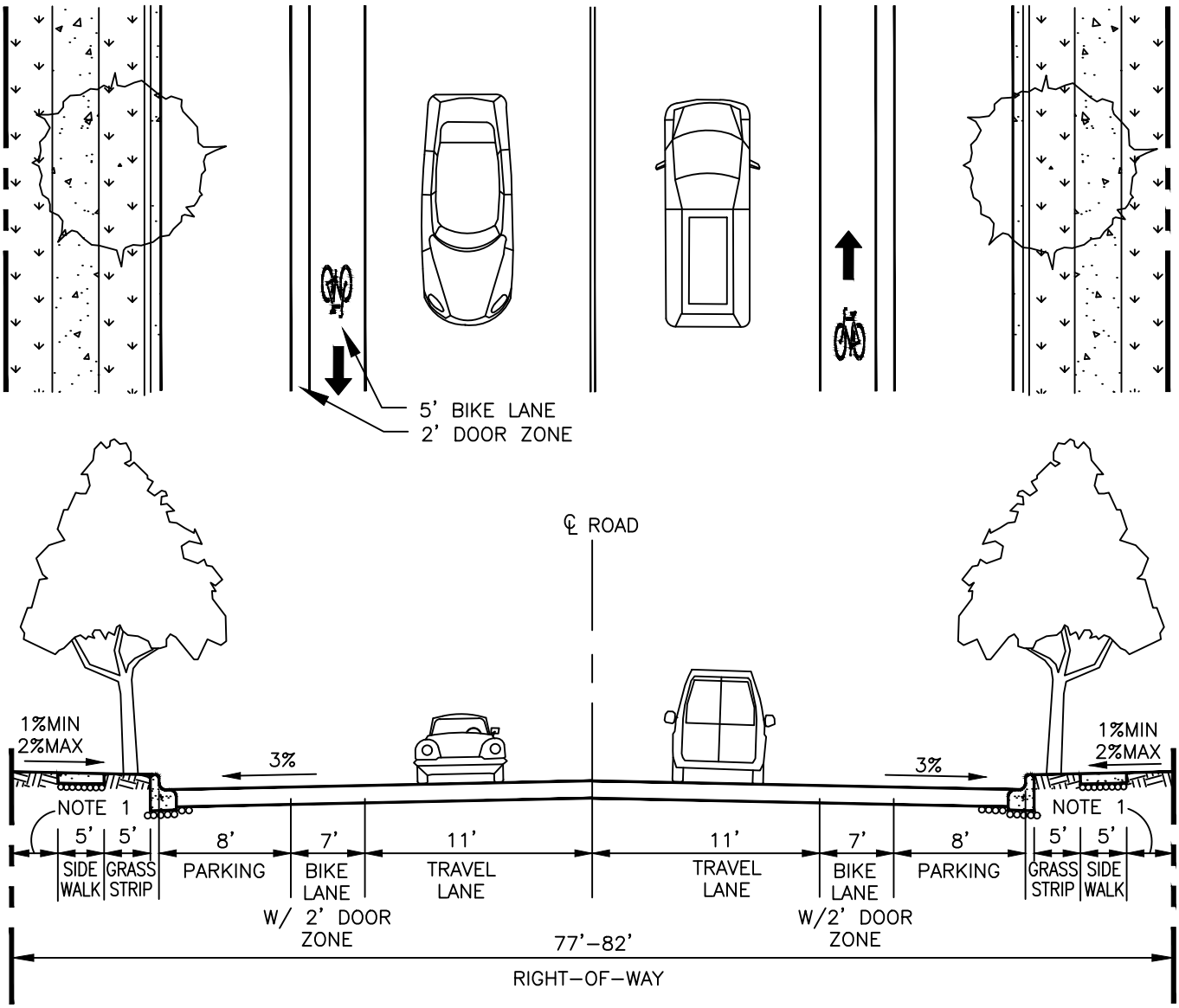
MARCH 2017



2 LANE STREET WITH PARKING & BIKE LANE

NTS

NOTES:

1. AREA NEEDED FROM BACK OF SIDEWALK TO THE EDGE OF THE CITY RIGHT–OF–WAY VARIES FROM 2' TO 4.5' FOR EACH SIDE OF ROADWAY BASED ON MINIMUM REQUIRED RIGHT–OF–WAY WIDTHS.
2. FOR ALL INTERSECTIONS OF URBAN PRINCIPAL ARTERIALS WITH OTHER URBAN PRINCIPAL OR MINOR ARTERIALS, LEFT TURN LANES AND RIGHT TURN LANES SHALL BE PROVIDED. ACCELERATION LANES SHALL BE PROVIDED AS DIRECTED BY CITY ENGINEER.
3. MINIMUM INTERSECTION RADIUS FOR URBAN COLLECTORS AND URBAN LOCALS SHALL BE 34'.
4. MODIFICATIONS TO ANY DETAILS SHALL BE DONE WITH THE APPROVAL OF CITY ENGINEER.
5. FOR STREET TREE, SIDEWALK, CURB & GUTTER AND PAVEMENT DETAILS, SEE LANDSCAPING AND STREET DETAIL SECTIONS IN LATEST CITY OF FREDERICK MANUAL.
6. ALL BIKE/PED LANE SIGNAGE, DELINEATION AND MARKINGS SHALL BE IN ACCORDANCE WITH THE NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS (NACTO) LATEST EDITIONS.

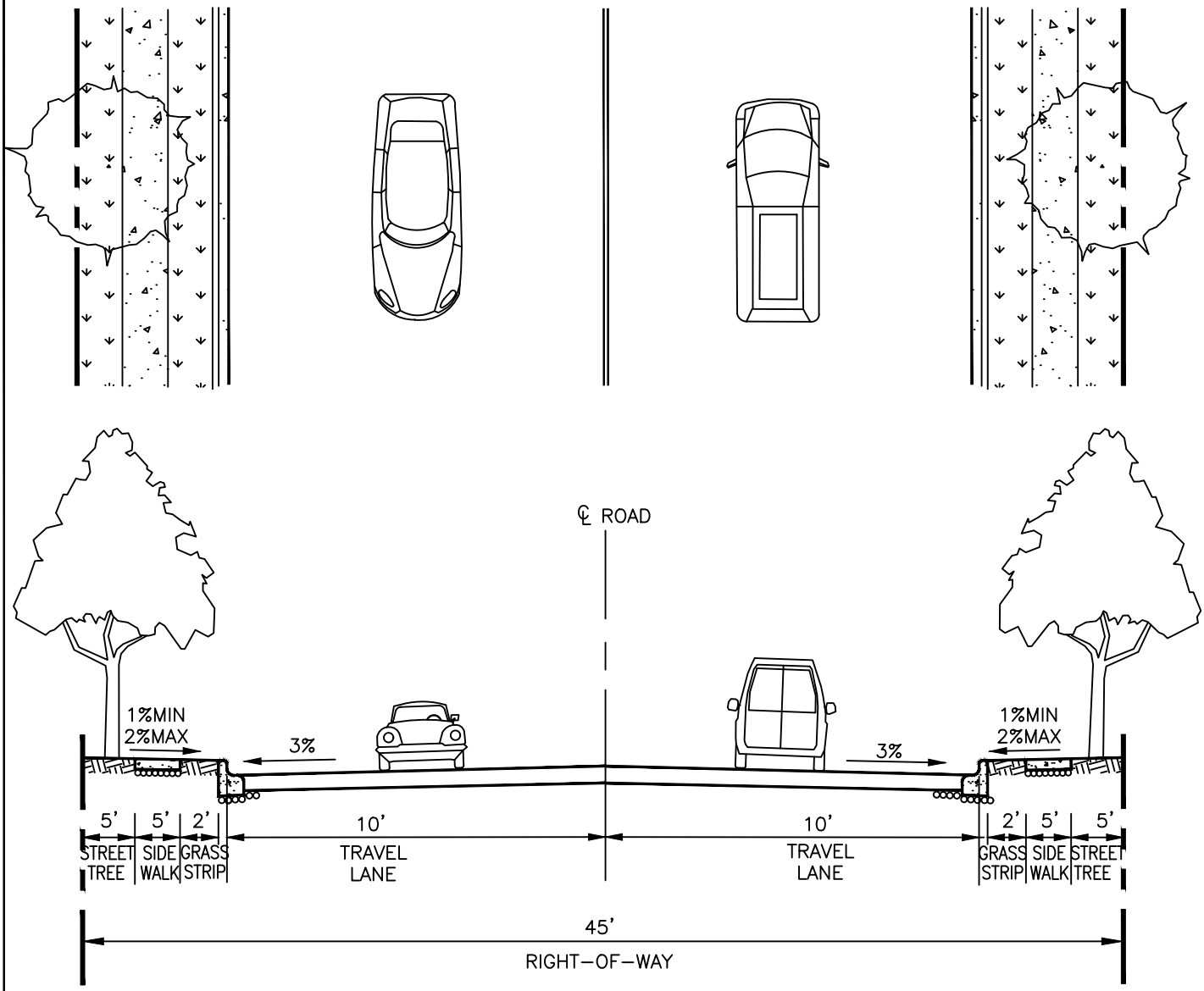
The City of Frederick Maryland

COLLECTOR
2 LANE ST. W/ BIKE LANE & PARKING

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-10.2

MARCH 2017



2 LANE STREET WITHOUT PARKING

NTS

NOTES:

1. MINIMUM INTERSECTION RADIUS FOR URBAN COLLECTORS AND URBAN LOCALS SHALL BE 34'.
2. MODIFICATIONS TO ANY DETAILS SHALL BE DONE WITH THE APPROVAL OF CITY ENGINEER.
3. FOR STREET TREE, SIDEWALK, CURB & GUTTER AND PAVEMENT DETAILS, SEE LANDSCAPING AND STREET DETAIL SECTIONS IN LATEST CITY OF FREDERICK MANUAL.
4. ON–STREET PARKING IS NOT PERMITTED.

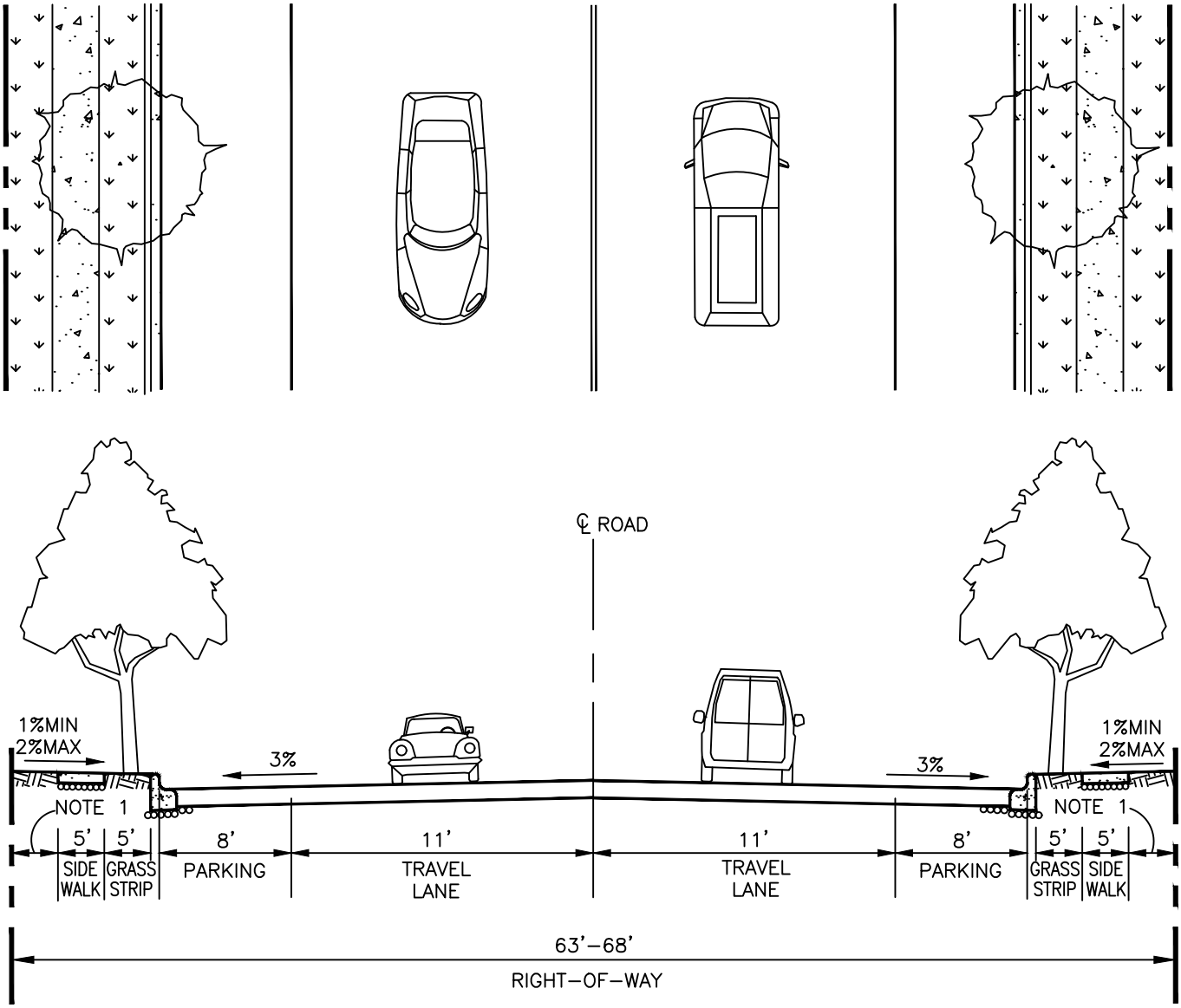
The City of Frederick Maryland

LOCAL
2 LANE STREET

ST-11.0

APPROVED: Zachary J. Kearbey
DIRECTOR–DEPARTMENT PUBLIC WORKS

MARCH 2017



2 LANE STREET WITH PARKING

NTS

NOTES:

1. AREA NEEDED FROM BACK OF SIDEWALK TO THE EDGE OF THE CITY RIGHT–OF–WAY VARIES FROM 2' TO 4.5' FOR EACH SIDE OF ROADWAY BASED ON MINIMUM REQUIRED RIGHT–OF–WAY WIDTHS.
2. MINIMUM INTERSECTION RADIUS FOR URBAN COLLECTORS AND URBAN LOCALS SHALL BE 34'.
3. MODIFICATIONS TO ANY DETAILS SHALL BE DONE WITH THE APPROVAL OF CITY ENGINEER.
4. FOR STREET TREE, SIDEWALK, CURB & GUTTER AND PAVEMENT DETAILS, SEE LANDSCAPING AND STREET DETAIL SECTIONS IN LATEST CITY OF FREDERICK MANUAL.

The City of Frederick Maryland

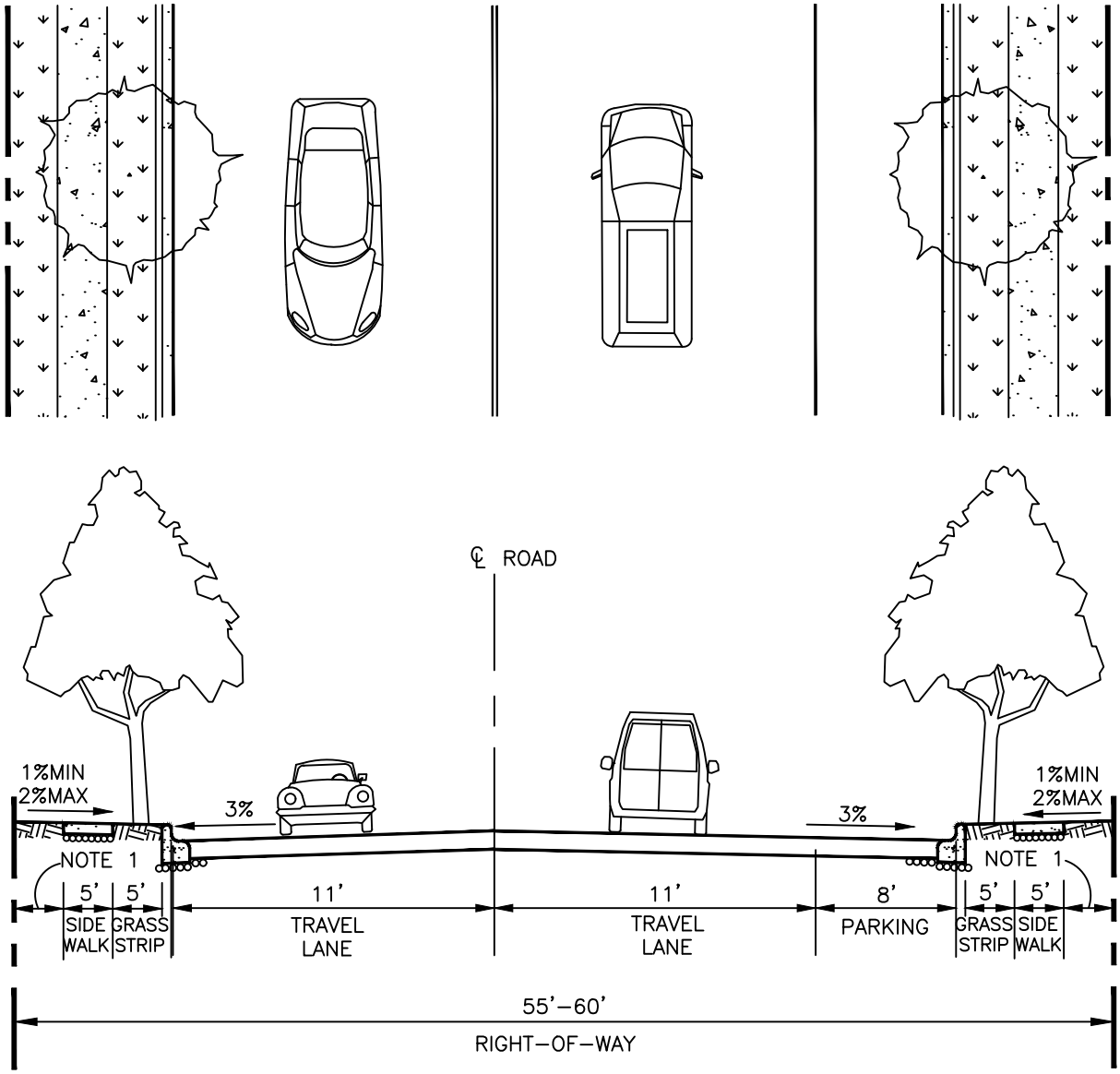
LOCAL
2 LANE STREET WITH PARKING

ST-11.1

APPROVED: Zachary J. Kearbey

DIRECTOR–DEPARTMENT PUBLIC WORKS

MARCH 2017



2 LANE STREET WITH PARKING ON ONE SIDE

NTS

NOTES:

1. AREA NEEDED FROM BACK OF SIDEWALK TO THE EDGE OF THE CITY RIGHT–OF–WAY VARIES FROM 2' TO 4.5' FOR EACH SIDE OF ROADWAY BASED ON MINIMUM REQUIRED RIGHT–OF–WAY WIDTHS.
2. MINIMUM INTERSECTION RADIUS FOR URBAN COLLECTORS AND URBAN LOCALS SHALL BE 34'.
3. MODIFICATIONS TO ANY DETAILS SHALL BE DONE WITH THE APPROVAL OF CITY ENGINEER.
4. FOR STREET TREE, SIDEWALK, CURB & GUTTER AND PAVEMENT DETAILS, SEE LANDSCAPING AND STREET DETAIL SECTIONS IN LATEST CITY OF FREDERICK MANUAL.

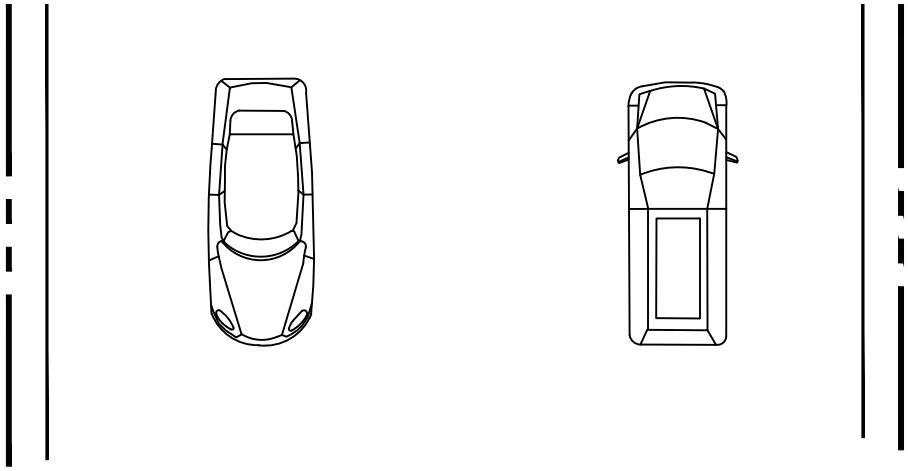
The City of Frederick Maryland

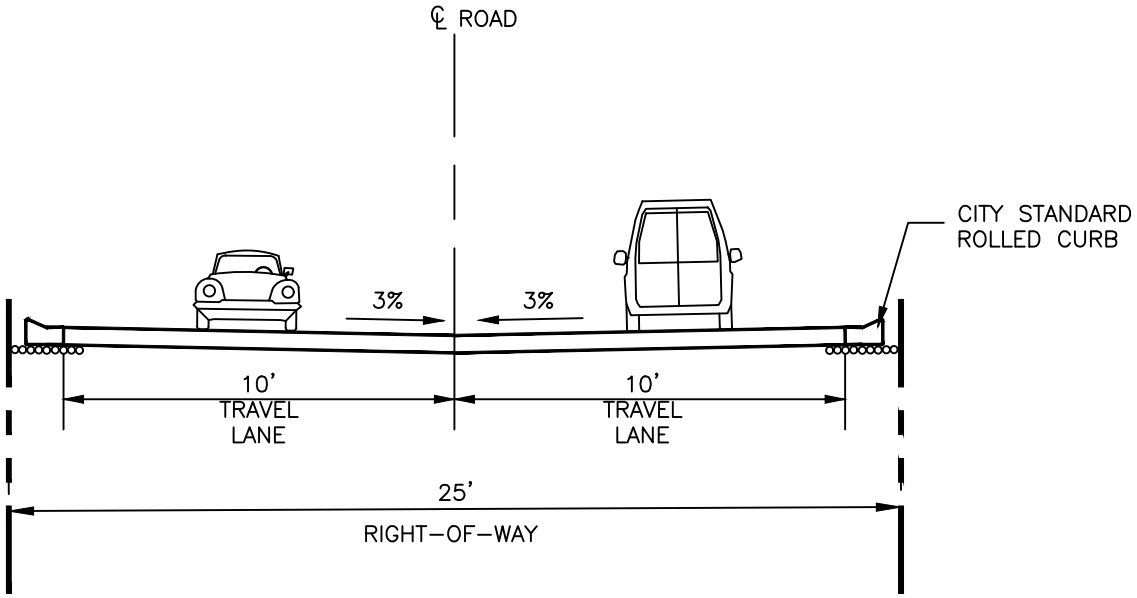
LOCAL
2 LANE STREET WITH PARKING ON ONE SIDE

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-11.2

MARCH 2017





ALLEY
NTS

NOTES:

1. MINIMUM INTERSECTION RADIUS FOR ALLEYS SHALL BE 25'.
2. MODIFICATIONS TO ANY DETAILS SHALL BE DONE WITH THE APPROVAL OF CITY ENGINEER.
3. ON–STREET PARKING IS NOT PERMITTED.
4. NO PUBLIC WATER OR SEWER UTILITY PERMITTED UNLESS RIGHT OF WAY IS A MINIMUM OF 30'.

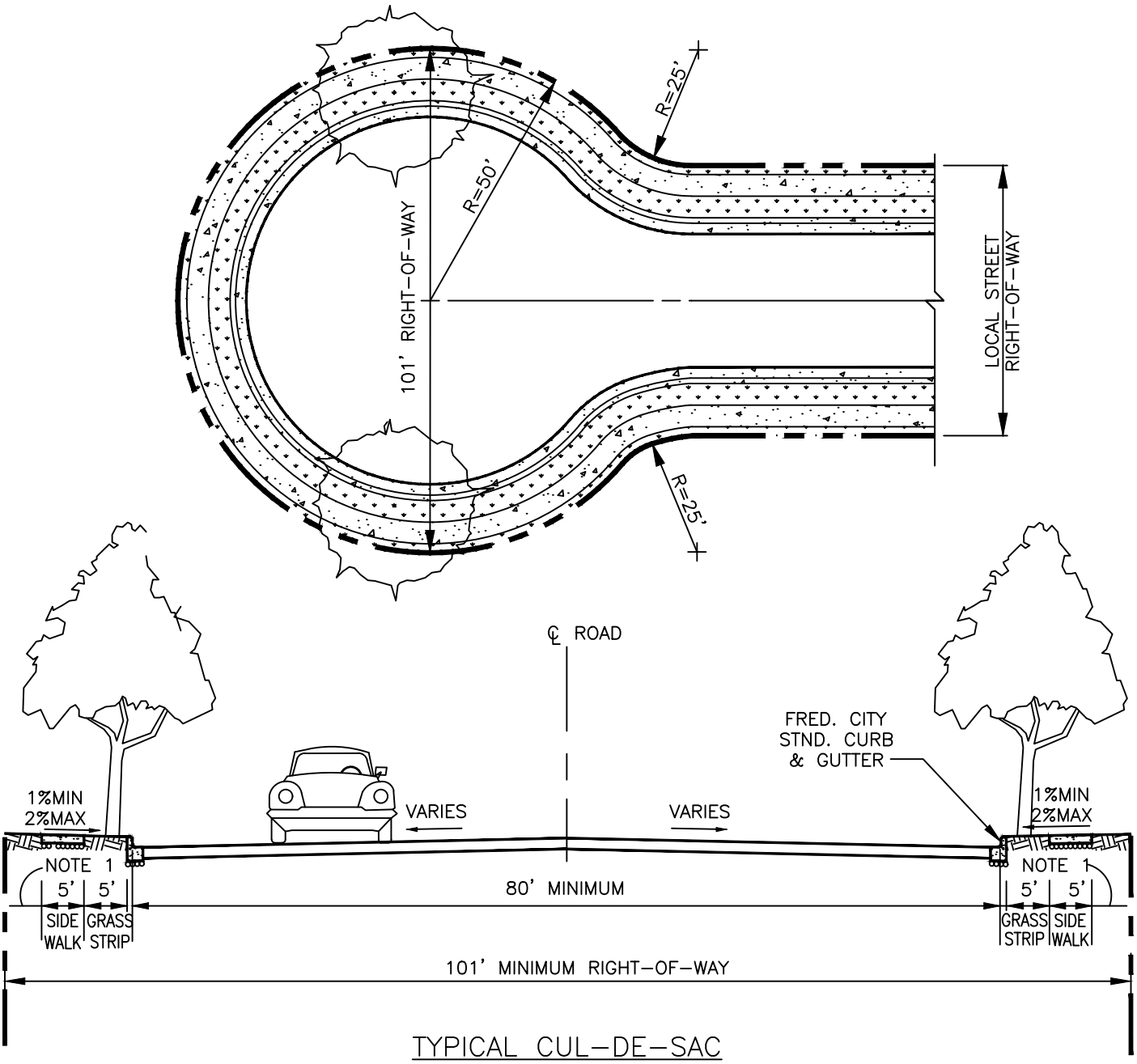
The City of Frederick Maryland

PUBLIC ALLEY

APPROVED: Zachary J. Kearbey
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-12.0

MARCH 2017



TYPICAL CUL-DE-SAC
NTS

NOTES:

1. AREA NEEDED FROM BACK OF SIDEWALK TO THE EDGE OF THE CITY RIGHT-OF-WAY VARIES FROM 0'-4' FOR EACH SIDE OF ROADWAY BASED ON MINIMUM REQUIRED RIGHT-OF-WAY WIDTHS.
2. FOR STREET TREE, SIDEWALK, CURB & GUTTER AND PAVEMENT DETAILS, SEE LANDSCAPING AND STREET DETAIL SECTIONS IN LATEST CITY OF FREDERICK DETAIL MANUAL.
3. ON-STREET PARKING IS NOT PERMITTED.

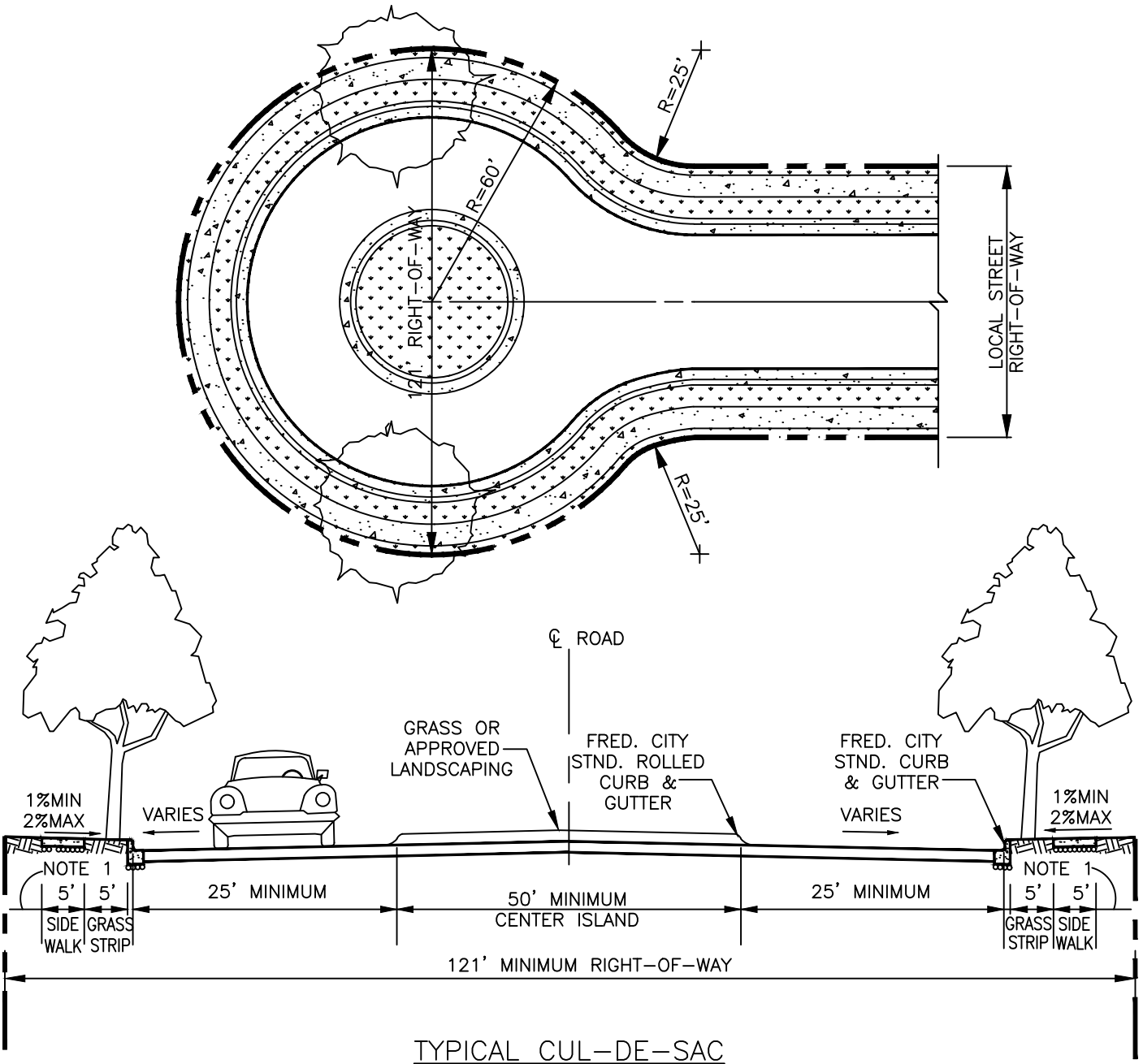
The City of Frederick Maryland

TYPICAL CUL-DE-SAC

APPROVED: Zachary J. Kershner
DIRECTOR-DEPARTMENT PUBLIC WORKS

ST-13.0

MARCH 2017



TYPICAL CUL-DE-SAC
NTS

NOTES:

1. AREA NEEDED FROM BACK OF SIDEWALK TO THE EDGE OF THE CITY RIGHT-OF-WAY VARIES FROM 0'-4' FOR EACH SIDE OF ROADWAY BASED ON MINIMUM REQUIRED RIGHT-OF-WAY WIDTHS.
2. FOR STREET TREE, SIDEWALK, CURB & GUTTER AND PAVEMENT DETAILS, SEE LANDSCAPING AND STREET DETAIL SECTIONS IN LATEST CITY OF FREDERICK DETAIL MANUAL.
3. LANDSCAPING IN CIRCLE SHOULD FOLLOW MSHA ROUNDABOUTS DESIGN GUIDELINES: SECTION 5.0
4. NO ON-STREET PARKING PERMITTED.

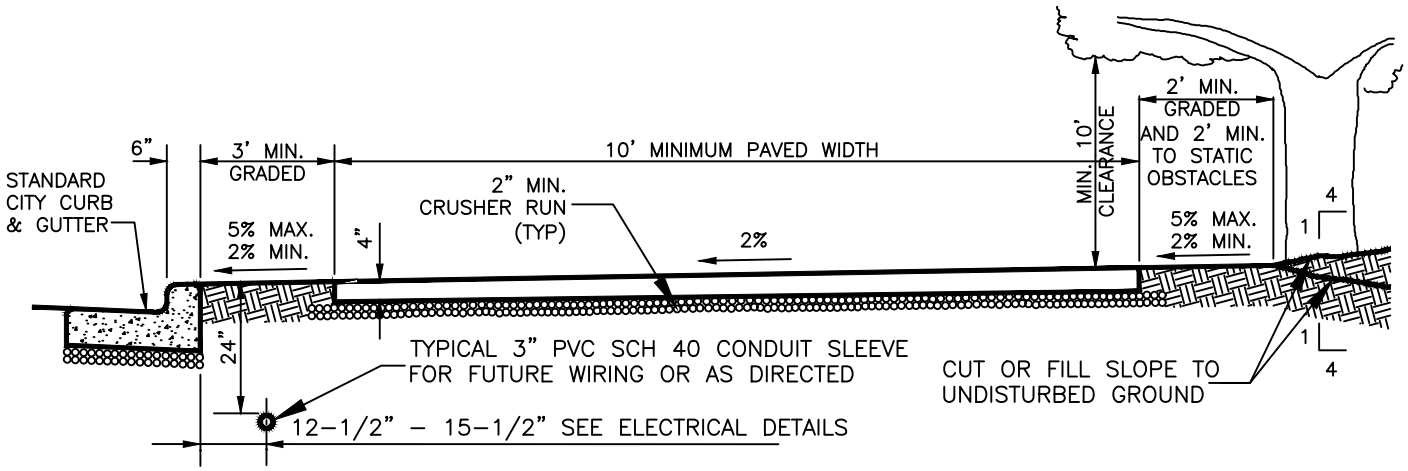
The City of Frederick Maryland

TYPICAL CUL-DE-SAC W/ CENTER ISLAND

APPROVED: Zachary J. Kershner
DIRECTOR-DEPARTMENT PUBLIC WORKS

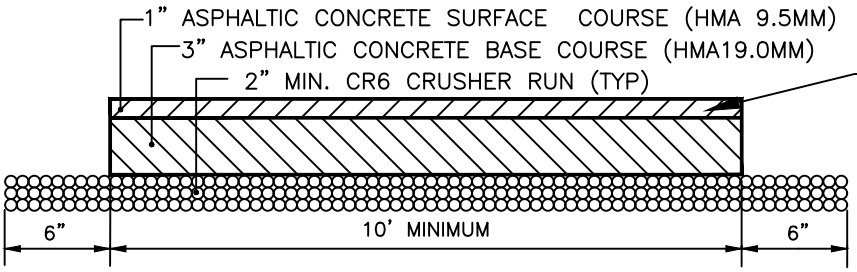
ST-13.1

MARCH 2017



BIKEWAY/WALK PATH SECTION

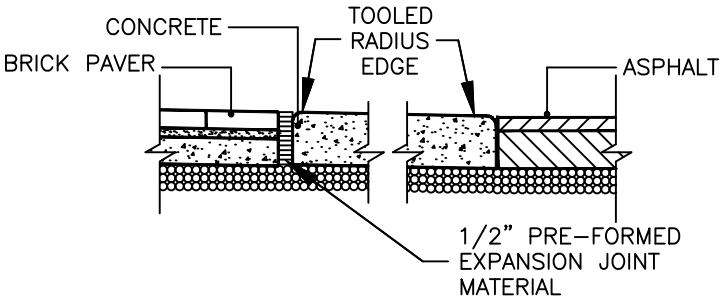
NTS



SURFACE ASPHALT MIX MUST BE A VIRGIN ASPHALT HOT MIX CONTAINING NO RECYCLED ASPHALT PAVING (RAP). BASE AND BINDER ASPHALT MIXES MAY CONTAIN RECYCLED ASPHALT PAVING (RAP) TO EXTENT ALLOWED BY MARYLAND STATE HIGHWAY ADMINISTRATION APPROVED HOT MIX DESIGN.

PAVING SECTION

NTS



TRANSITION DETAIL

NTS

NOTES:

1. ALL DESIGNS SHALL BE IN ACCORDANCE WITH AASHTO'S GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES, FHWA'S MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND MARYLAND ACCESSIBILITY CODE, LATEST EDITION
2. PATHWAY PAVEMENT SHALL BE FREE OF BUMPS, HOLES AND OTHER SURFACE IRREGULARITIES AND THE EDGE OF PAVEMENT SHALL BE UNIFORM. PATHWAY PAVEMENT SHALL BE MACHINE LAID; SOIL STERILANTS SHALL BE USED WHERE NECESSARY TO PREVENT VEGETATION FROM ERUPTING THROUGH THE PAVEMENT. HARD, ALL WEATHER PAVEMENT SURFACES SHALL BE USED.
3. PATHWAYS SHALL BE DESIGNED TO PROVIDE ADEQUATE ACCESS FOR EMERGENCY, PATROL, AUTHORIZED SERVICE AND MAINTENANCE VEHICLES. LOADS ON PATHWAY WILL BE SUBSTANTIALLY LESS THAN HIGHWAY LOADS BUT SHALL BE DESIGNED TO SUSTAIN LOADS OF THESE VEHICLES. MOTOR VEHICLES CAN CAUSE PATHWAY PAVEMENT EDGE DAMAGE, ADEQUATE EDGE SUPPORT SHALL BE PROVIDED THROUGH STABILIZED SHOULDERS OR BY ADDITIONAL PAVEMENT WIDTH.
4. DESIGN SPEED SHALL BE A MINIMUM OF 20 MILES PER HOUR ON LEVEL TERRAIN WITH A 130 FOOT MINIMUM SIGHT DISTANCE.
5. CROSS SLOPE TO BE 2%. EXCEPT FOR SHOULDER AREAS WHICH CAN HAVE A MAXIMUM SLOPE OF 5% AND A MINIMUM SLOPE OF 2%.
6. OVERHEAD CLEARANCE SHALL BE A MINIMUM OF 10'. HORIZONTAL CLEARANCE TO STATIC OBSTACLES SHALL BE A MINIMUM OF 2'. CLEARANCES FOR BRIDGES, TUNNELS AND ANY OTHER SPECIAL CONDITIONS SHALL BE DETERMINED ON A CASE BY CASE BASIS WITH THE APPROVAL OF THE CITY ENGINEER.
7. PROPER LIGHTING FOR BIKE AND PEDESTRIAN TRAFFIC REQUIRED.

The City of Frederick Maryland

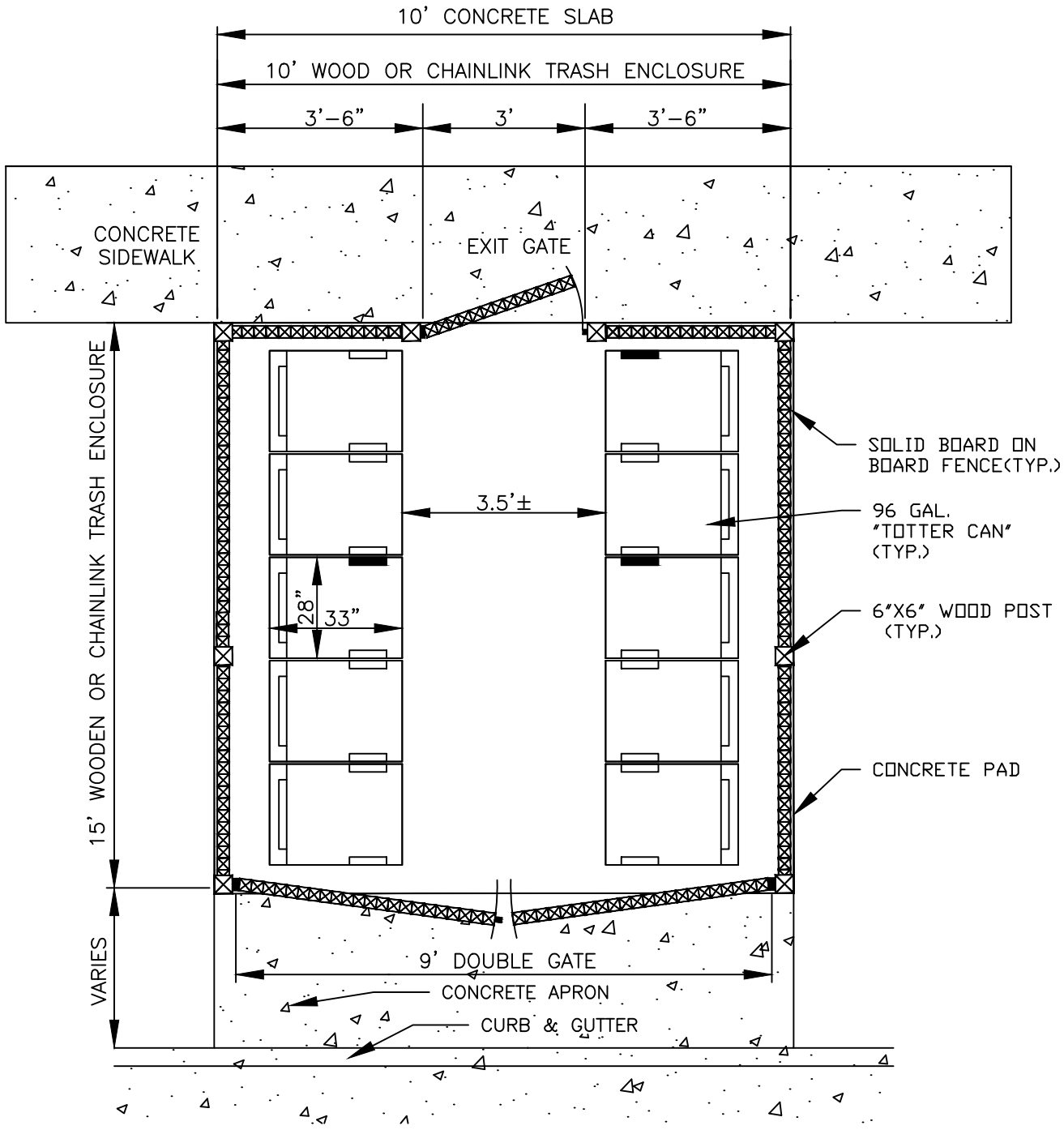
COMBINED BIKEWAY/WALK PATH ALONG PUBLIC STREEET

APPROVED: Zachary J. Kershner

DIRECTOR-DEPARTMENT PUBLIC WORKS

ST-14.0

MARCH 2017



TOP VIEW
NTS

NOTES:

1. FOR DUMPSTER ENCLOSURE DEPRESSED CURB AND RAMP DETAILS SEE DETAIL SHEET ST-15.5
2. FOR DUMPSTER ENCLOSURE CONCRETE PAD DETAIL SEE DETAIL SHEET ST-15.5 3. FOR DUMPSTER ENCLOSURE GENERAL NOTES SEE DETAIL SHEET ST-15.6

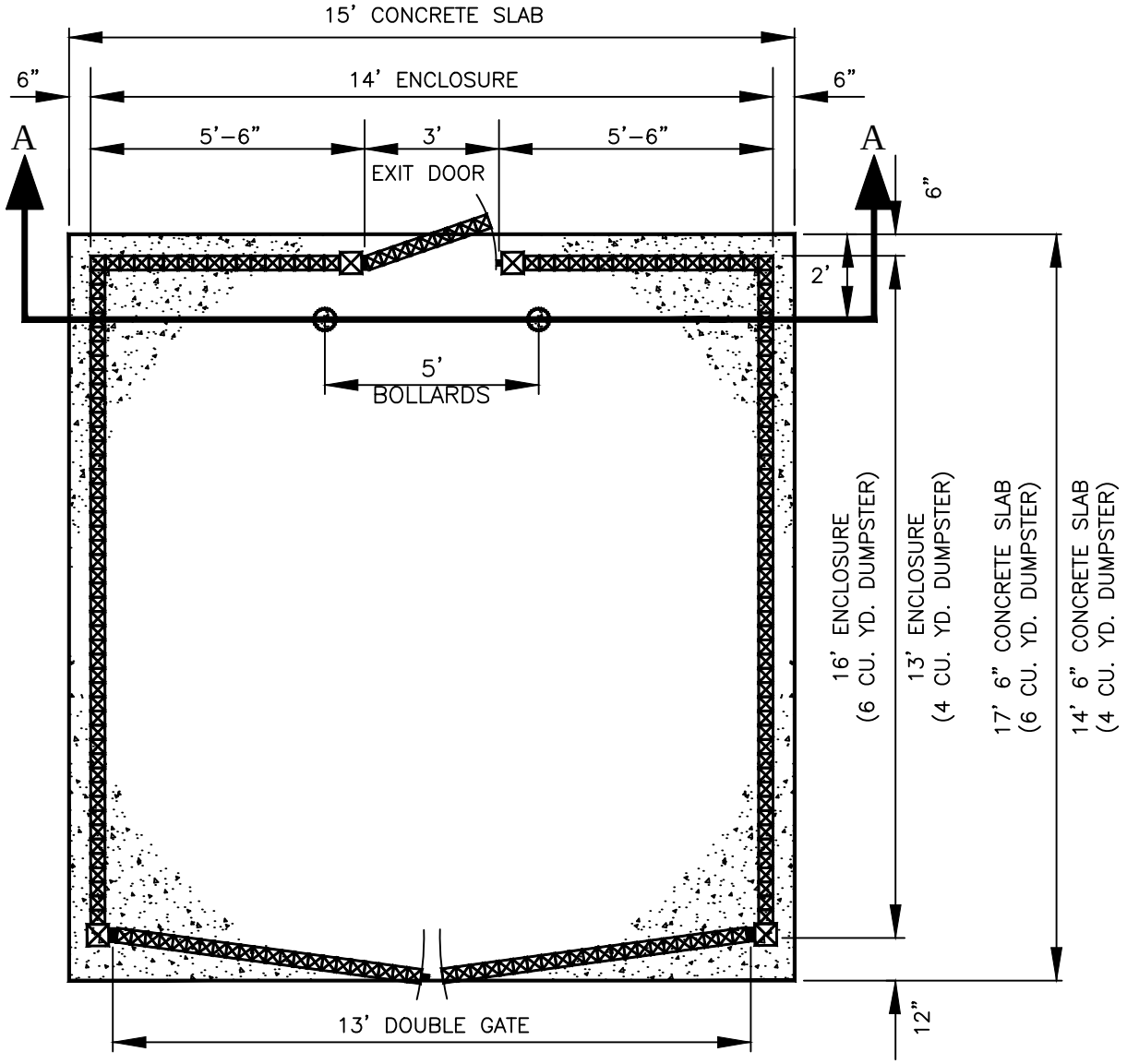
The City of Frederick Maryland

DUMPSTER ENCLOSURE, MULTIPLE RESIDENTIAL CONTAINERS

APPROVED: _____
DIRECTOR-DEPARTMENT PUBLIC WORKS

ST-15.0

MARCH 2017



TOP VIEW
NTS

NOTES:

1. FOR DUMPSTER ENCLOSURE DEPRESSED CURB AND RAMP DETAILS SEE DETAIL SHEET ST-15.5.
2. FOR DUMPSTER ENCLOSURE CONCRETE PAD DETAIL SEE DETAIL SHEET ST-15.5
3. FOR DUMPSTER ENCLOSURE GENERAL NOTES SEE DETAIL SHEET ST-15.6

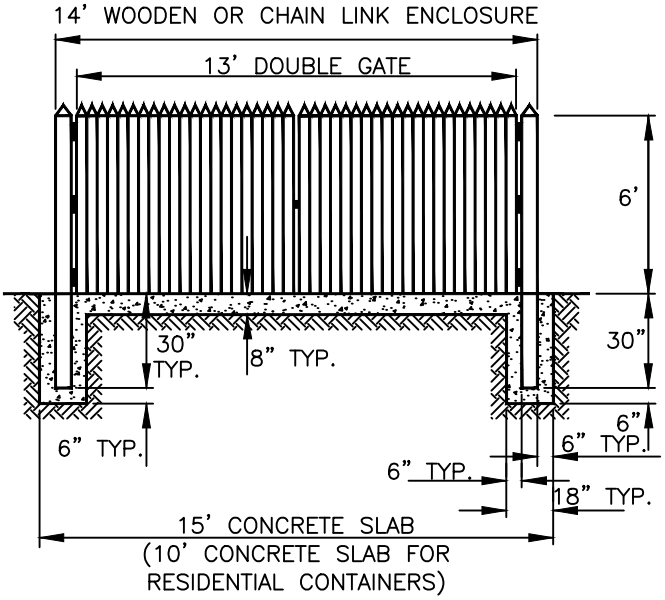
The City of Frederick Maryland

DUMPSTER ENCLOSURE
(1) 4 OR 6 CU. YD. CONTAINER

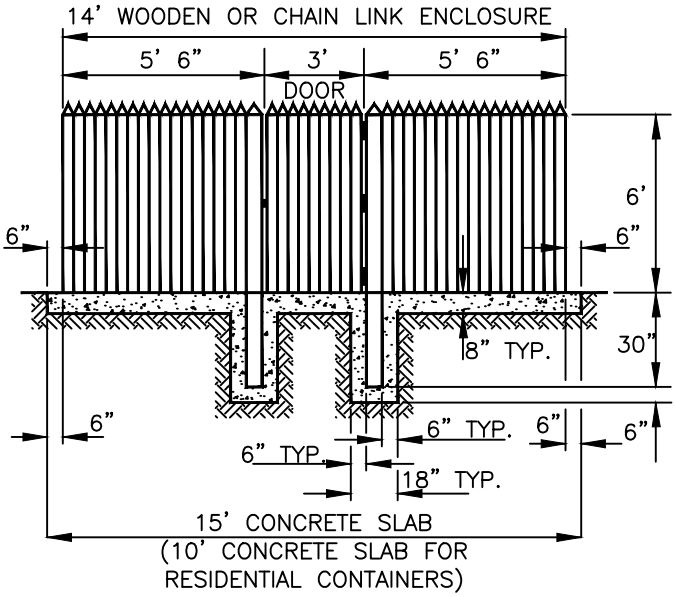
APPROVED: Zachary J. Kershner
DIRECTOR-DEPARTMENT PUBLIC WORKS

ST-15.1

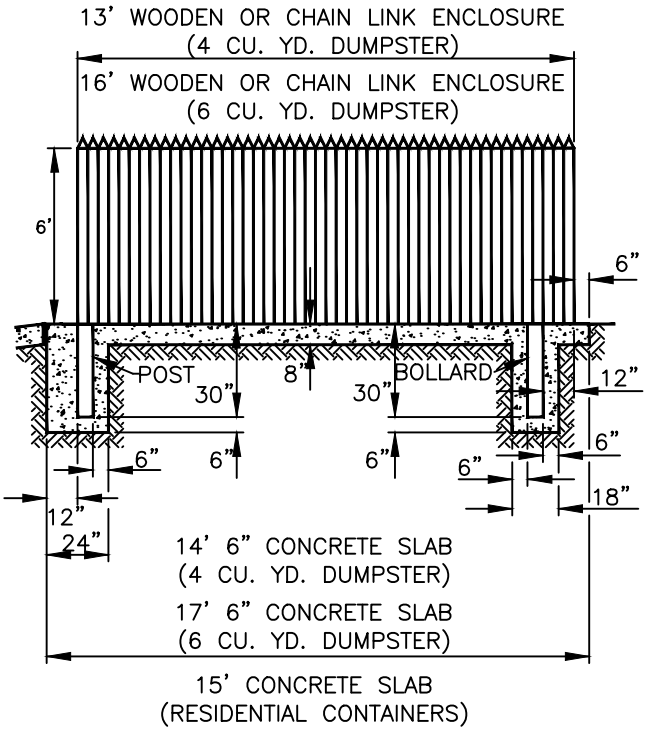
MARCH 2017



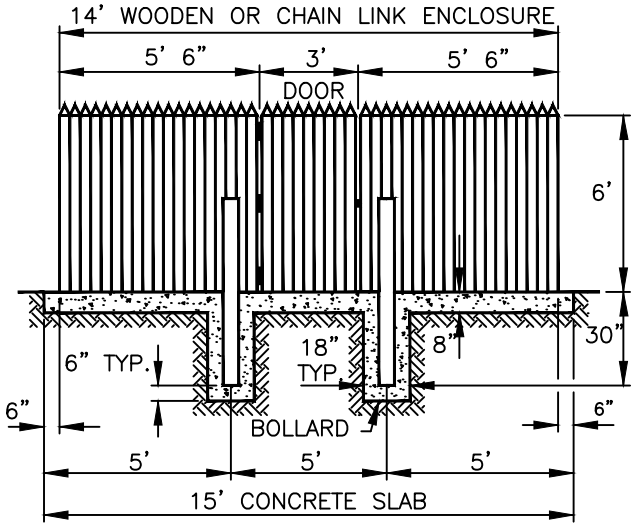
FRONT VIEW
NTS



REAR VIEW
NTS



SIDE VIEW
NTS



BOLLARD SECTION A–A
NTS

NOTES:

1. FOR DUMPSTER ENCLOSURE DEPRESSED CURB AND RAMP DETAIL SEE DETAIL ST–15.5
2. FOR DUMPSTER ENCLOSURE GENERAL NOTES SEE DETAIL SHEET ST–15.6

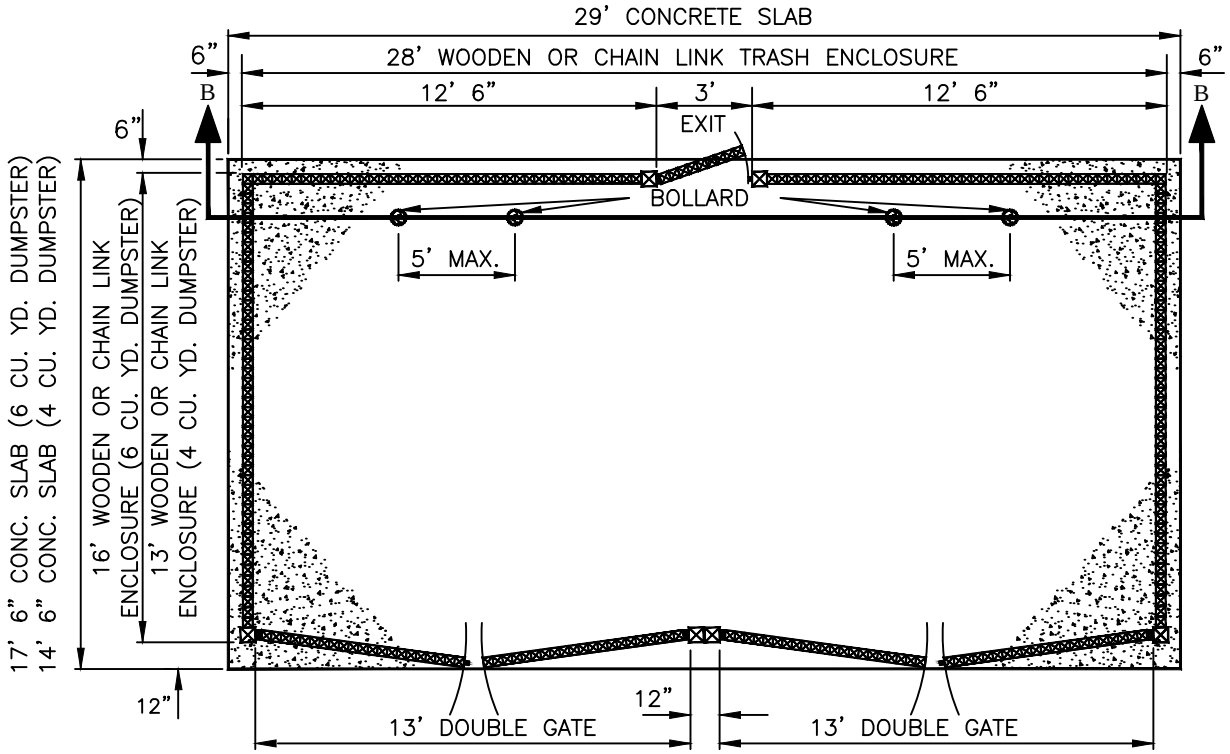
The City of Frederick Maryland

DUMPSTER ENCLOSURE
(1) 4 OR 6 CU. YD. CONTAINER

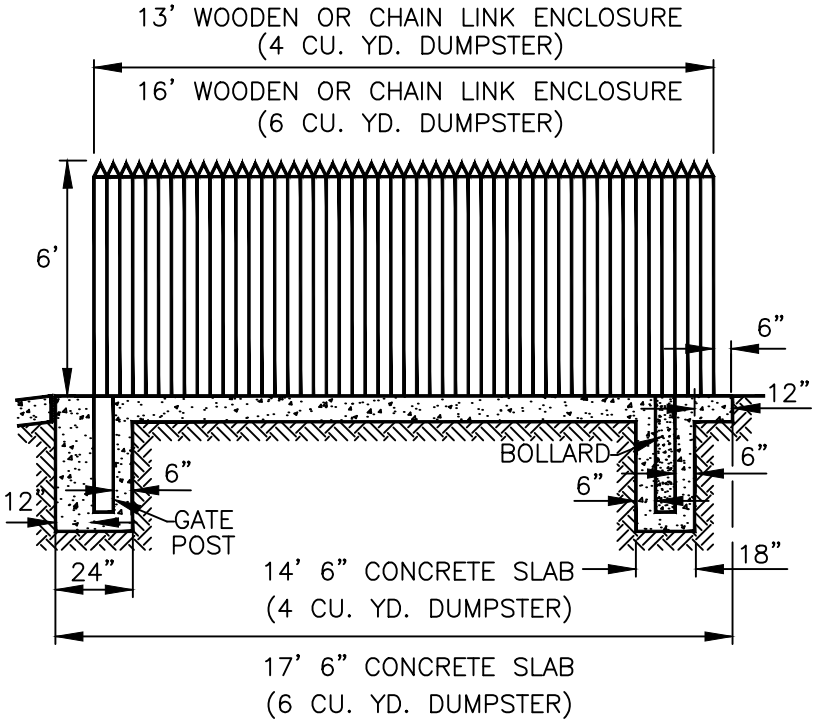
ST-15.2

APPROVED: Zachary J. Kearbey
DIRECTOR–DEPARTMENT PUBLIC WORKS

MARCH 2017



TOP VIEW
NTS



SIDE VIEW
NTS

NOTES:

1. FOR DUMPSTER ENCLOSURE DEPRESSED CURB AND RAMP DETAILS SEE DETAIL SHEET 15.5
2. OR BOLLARD SECTION SEE DETAIL SHEET ST–15.4
3. FOR DUMPSTER ENCLOSURE GENERAL NOTES SEE DETAIL SHEETS ST–15.6

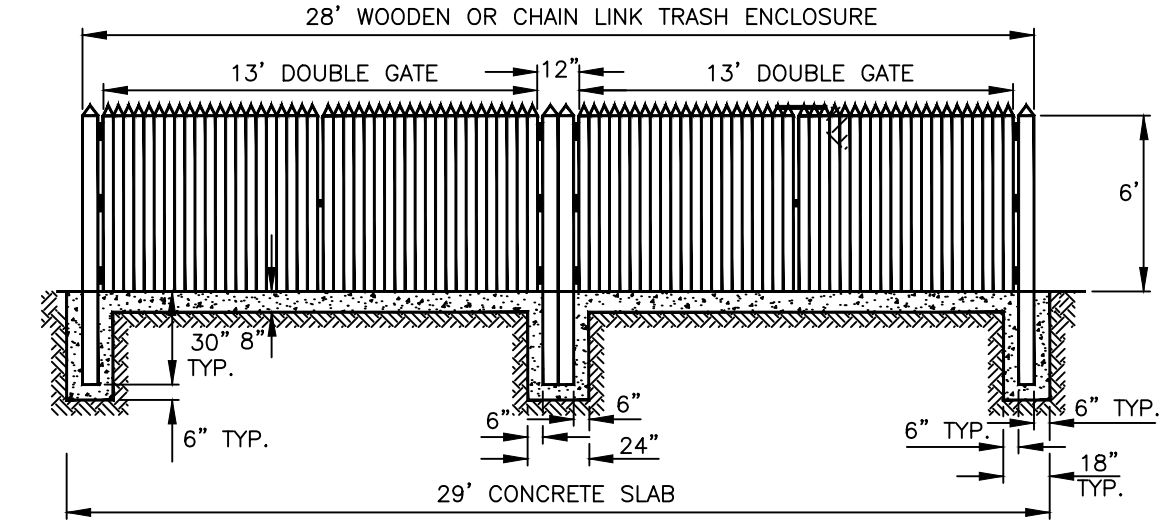
The City of Frederick Maryland

DUMPSTER ENCLOSURE
(2) 4 OR 6 CU.YD. CONTAINERS

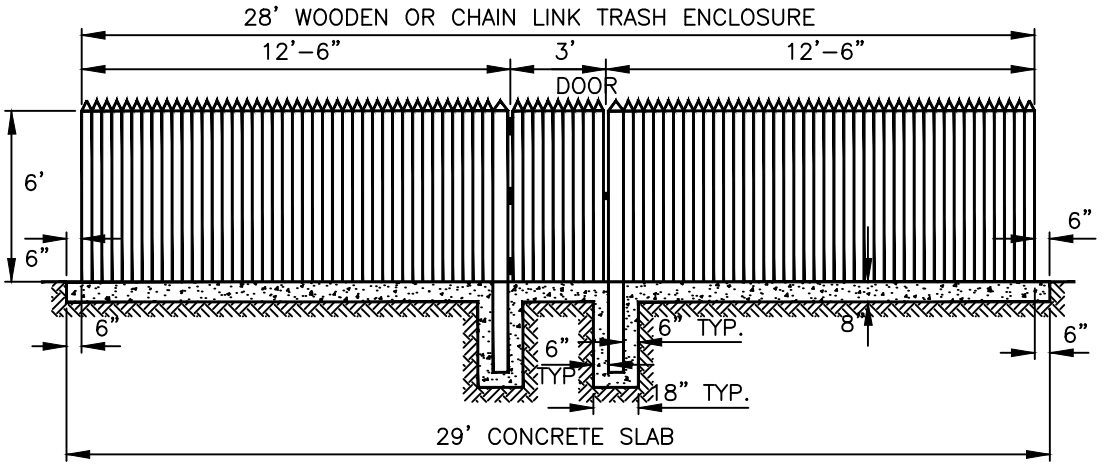
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-15.3

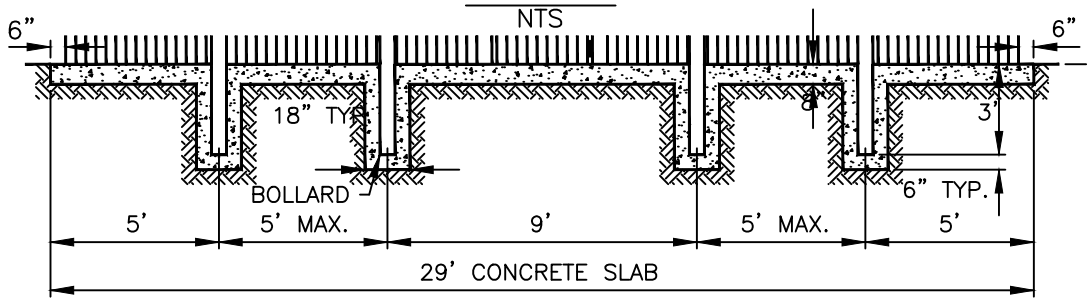
MARCH 2017



FRONT VIEW
NTS



REAR VIEW
NTS



BOLLARD SECTION B–B
NTS

NOTES:

1. FOR DUMPSTER ENCLOSURE DEPRESSED CURB AND RAMP DETAILS SEE DETAIL SHEET 15.5
2. FOR DUMPSTER ENCLOSURE GENERAL NOTES SEE DETAIL SHEETS ST–15.6
3. FOR CONCRETE PAD DETAIL SEE DETAIL SHEET ST–15.5

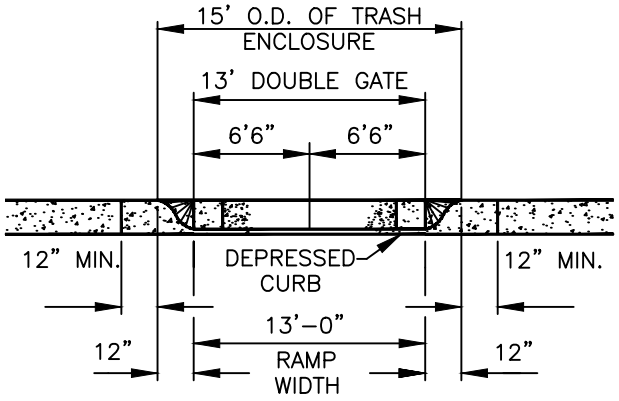
The City of Frederick Maryland

DUMPSTER ENCLOSURE (2)4OR6 CU. YD. CONTAINER FRONT & SIDE VIEW

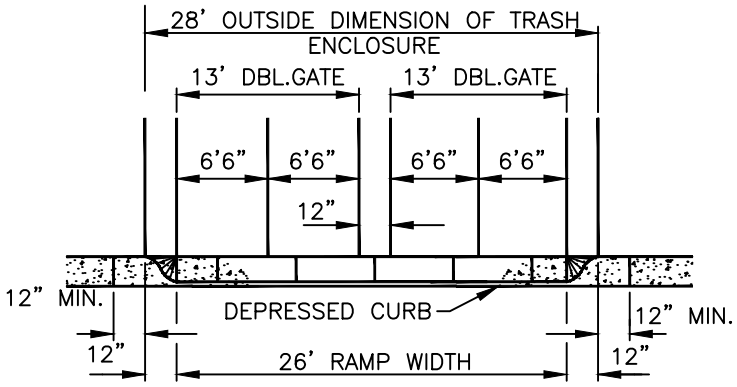
APPROVED: Zachary J. Kearbey
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-15.4

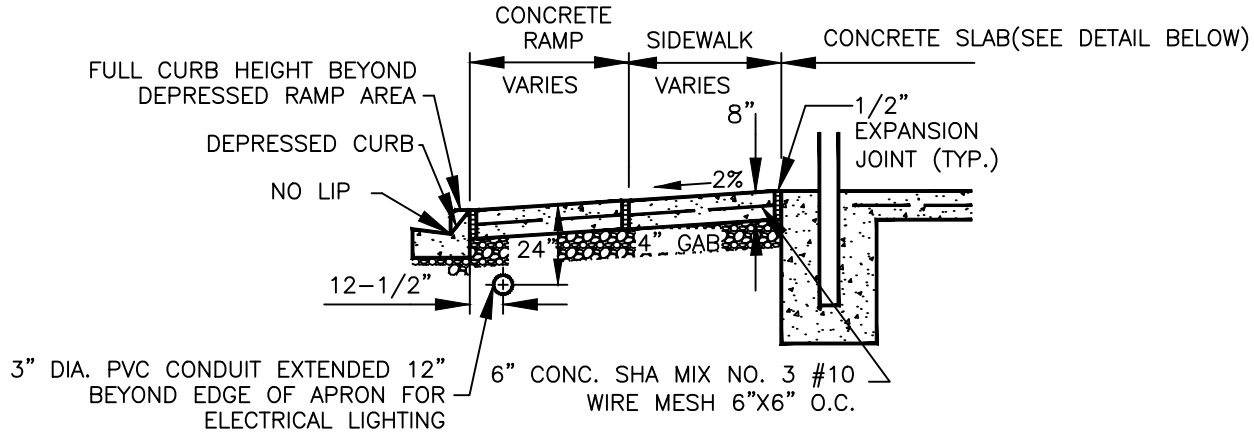
MARCH 2017



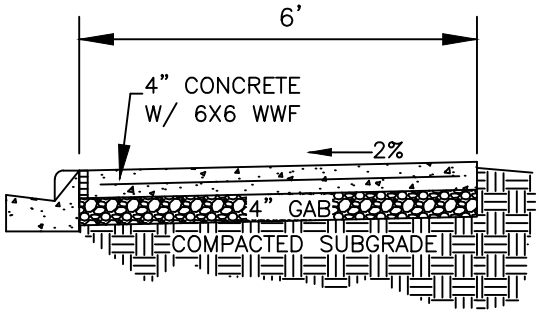
DEPRESSED CURB & RAMP FRONT VIEW
FOR SINGLE CONTAINER ENCLOSURE
NTS



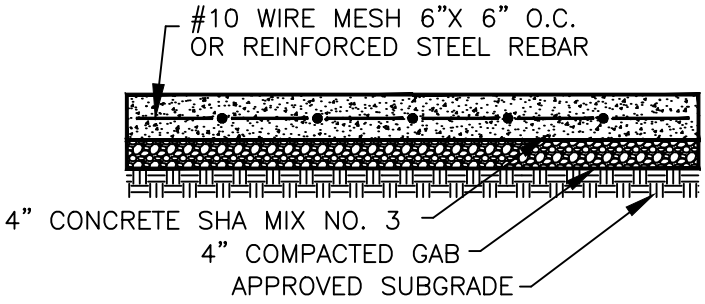
DEPRESSED CURB & RAMP FRONT VIEW
FOR DOUBLE CONTAINER ENCLOSURE
NTS



DEPRESSED CURB & RAMP SIDE VIEW
NTS



HOA TRASH PICK-UP
NTS



CONCRETE SLAB DETAIL
NTS

The City of Frederick Maryland

DUMPSTER ENCLOSURES AND TRASH BIN PICK UP DETAILS

APPROVED: _____
DIRECTOR-DEPARTMENT PUBLIC WORKS

ST-15.5

MARCH 2017

1. LOCATION
   1.1. BEFORE CONSTRUCTION, THE PROPERTY OWNER OR CONTRACTOR SHALL CONTACT THE SUPERINTENDENT OF WASTE COLLECTION AND DISPOSAL TO VERIFY ENCLOSURE LOCATION. PHONE: 301–694–1377.
   1.2. THE LOCATION AND ARRANGEMENT OF ENCLOSURE MUST ALLOW FOR SAFE MANEUVERING OF THE TRASH COLLECTION VEHICLE. TRUCK PARAMETERS: LENGTH=37FT. WIDTH=8FT. MINIMUM TURNING RADIUS=52 FT.

2. CONCRETE PAD
   2.1. MINIMUM 4 INCHES OF STONE BASE; MINIMUM 4–INCH SLAB WITH #10 WIRE MESH 6"X 6" O.C. CLASS MSHA MIX NO. 3 CONCRETE; SPRAYED WITH LIQUID CURING COMPOUND.
   2.2. SCORE 1/4–INCH DUMMY CONTRACTION JOINTS AT 4'–0" INTERVALS
   2.3. CONSTRUCT 1/2–INCH BITUMINOUS EXPANSION JOINTS AT 20'–0" INTERVALS (MAXIMUM)

3. DEPRESSED CURB AND RAMP
   3.1. CURB AND SIDEWALK IN FRONT OF DOUBLE GATE SHALL BE DEPRESSED TO ALLOW THE TRASH PACKER TO BACK UP TO THE TRASH ENCLOSURE IN AREAS WERE NO CONCRETE CURB OR SIDEWALK EXISTS,
   3.2. A CONCRETE RAMP SHALL BE CONSTRUCTED AND SLOPED DOWN FROM THE TRASH ENCLOSURE CONCRETE SLAB TO MEET THE EXISTING PAVEMENT IN THE CASE OF BRICK SIDEWALKS, THE REQUIREMENT FOR A SLOPED CONCRETE RAMP IS STILL PERTINENT

4. GATES
   4.1. GATE POSTS (DOUBLE GATE)– 18 LB MINIMUM I–BEAM, OR CONCRETE– FILLED 6" (1/4–INCH WALL) STEEL PIPE.
   4.2. GATE POSTS (EXIT DOOR)– 6"X 6" PRESSURE TREATED, OR EQUIVALENT IN OTHER MATERIALS; ANCHORED IN CONCRETE ALL GATES OPEN OUT.
   4.3. ALL GATES SHALL BE REINFORCED SO AS TO MINIMIZE SAG DOUBLE GATES MUST HAVE MEANS FOR SECURING THEM IN THE OPEN AND CLOSED POSITION

5. WALLS
   5.1. WOODEN ENCLOSURE– PRESSURE TREATED MATERIALS. POSTS TO BE 4"X4" (MINIMUM). SURFACE MOUNTED TO CONCRETE WITH USE OF A GALVANIZED POST–BOOT
   5.2. CHAIN LINK ENCLOSURE ALL FRAME MATERIAL SHALL BE SCH. 40 LCX. CORNER POSTS SHALL BE 3" DIAMETER. TOP RAIL AND FILL–INS SHALL BE 1–5/8" DIAMETER. GATE FRAME SHALL BE 2" BOTTOM AND SIDES WITH 1–5/8" FILL–IN. FENCE SHALL BE 9 GA. VINYL FABRIC WITH 9 GA. VINYL WIRE AT BOTTOM FOR STRENGTH. VINYL FABRIC SHALL BE SLEEVED WITH PVP PLASTIC VINYL SLATS

6. BOLLARDS
   6.1. PROVIDE BOLLARDS ALONG THE REAR WALL IN FRONT OF REAR EXIT. SHALL BE CONCRETE–FILLED PIPE (6"X¼" WALL, MINIMUM, 36" BELOW GRADE IN A MINIMUM OF 18" DIAMETER CONCRETE.

7. ILLUMINATION
   7.1. THE ENCLOSURE AREA MUST BE ILLUMINATED TO IESNA STANDARDS FOR PUBLIC USE. THE ENCLOSURE DOES NOT NECESSARILY REQUIRE SEPARATE LIGHTING; ILLUMINATION CAN BE PROVIDED BY AMBIENT LIGHTING, IF ADEQUATE

DUMPSTER SPECIFICATIONS		
Capacity (CU. YDS.)	4	6
Walls (GAUGE STEEL)	12	12

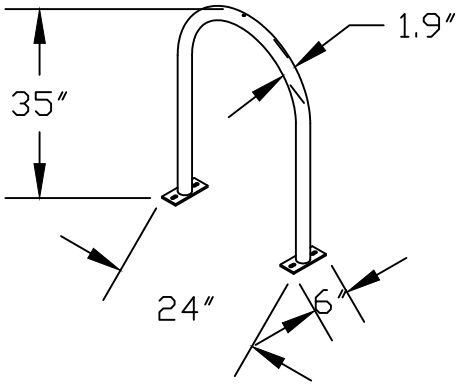
The City of Frederick Maryland

DUMPSTER ENCLOSURE GENERAL NOTES

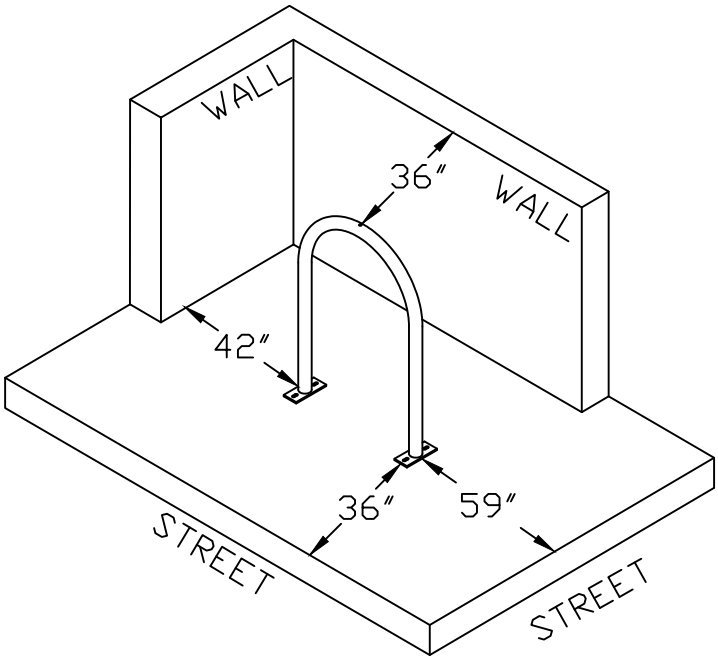
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-15.6

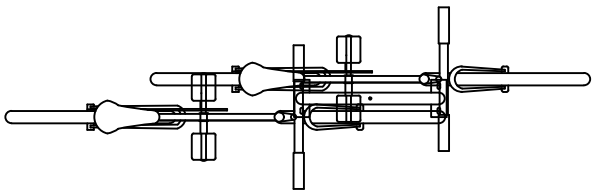
MARCH 2017



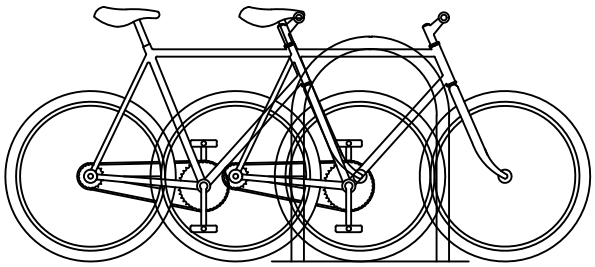
BIKE RACK
NTS



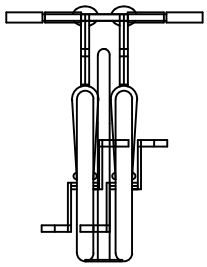
INSTALLATION DETAIL
NTS



TOP VIEW
NTS



SIDE VIEW A
NTS



SIDE VIEW B
NTS

NOTES:

1. GALVANIZED AND POWDER COATED WITH APPROVED COLOR
2. FOOT MOUNTS, 2.5"X6"X.25" ANCHORED WITH TWO WEDGE ANCHORS
3. RACK TO BE DERO "HOOP RACK" OR APPROVED EQUAL

The City of Frederick Maryland

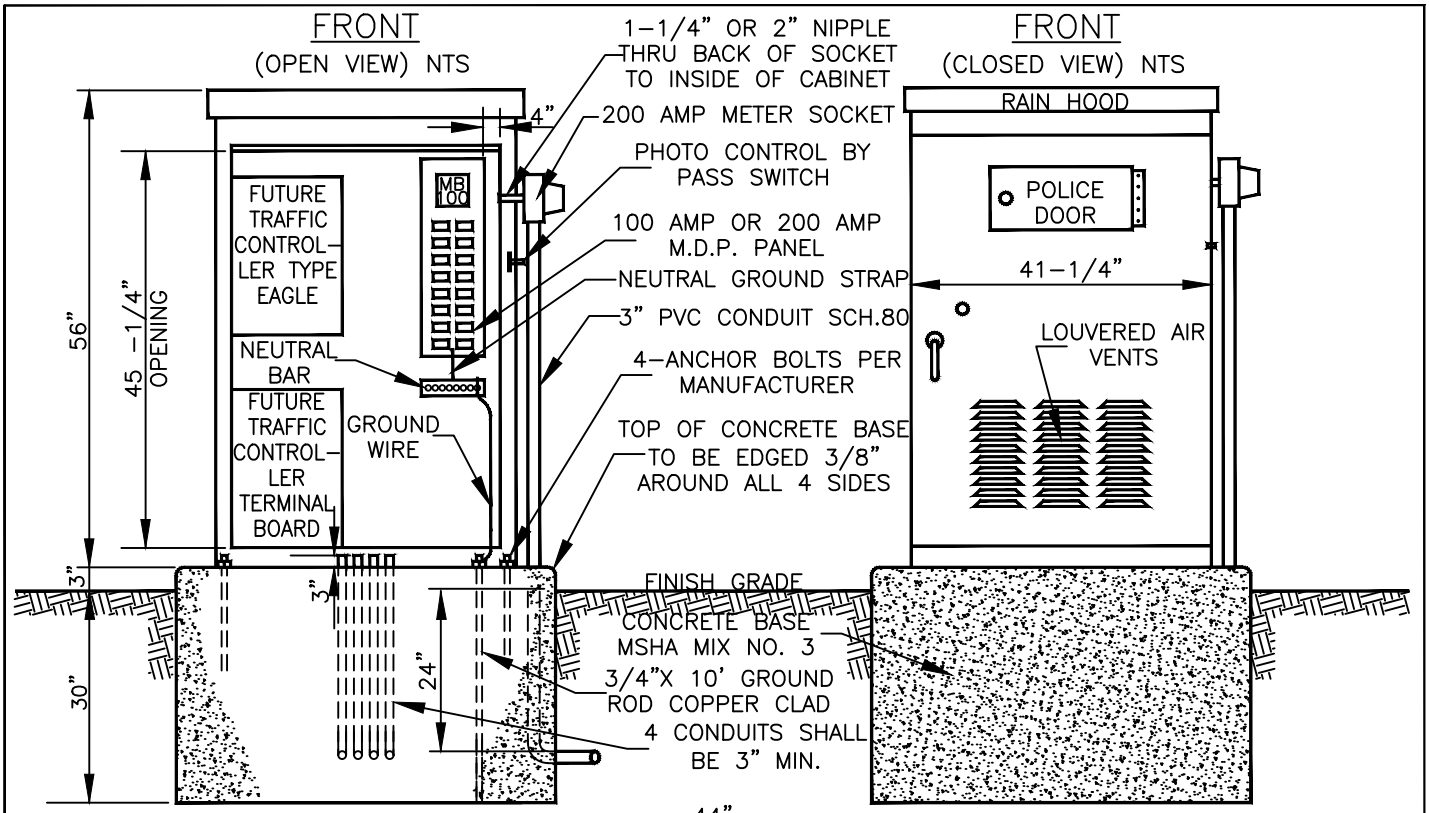
BIKE RACK DETAIL

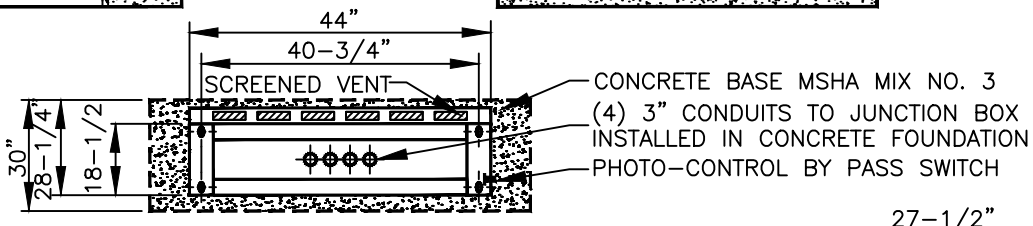
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

ST-16.0

MARCH 2017

TRAFFIC DETAILS

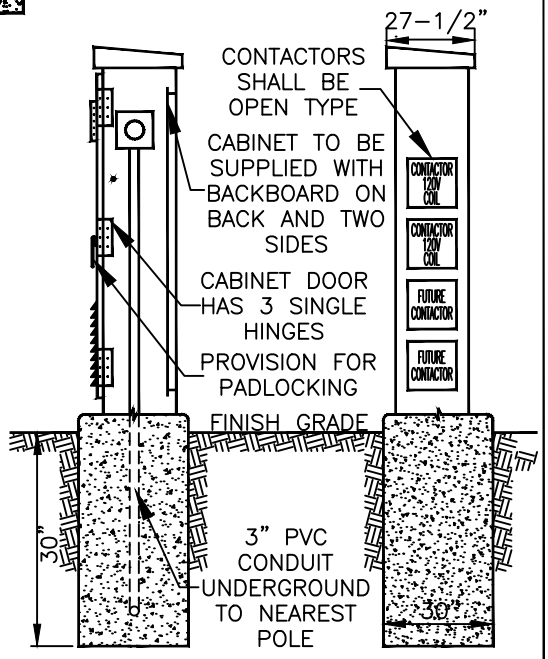




BOTTOM
NTS

NOTES:

1. SHOP DRAWING MUST BE SUBMITTED PRIOR TO INSTALATION
2. PHOTO–CONTROL BY PASS SWITCH CHICAGO LOCK #C2174–2DC–2001 AND LOCK COVER #FO–DC1 120 VOLT, 7 AMPS.
3. LOCK HOLE IN CABINET SHALL BE DRILLED WITH APPROPRIATE KNOCK OUT. FLAT ON BOTTOM, NOT ROUND. ALSO DRILL SIDE PANEL TO ACCOMMODATE ACCESS TO SWITCH TERMINALS.
4. PHOTO–ELECTRIC CONTROL, VERIFY TYPE OF CONTROL AND LOCATION WITH THE CITY OF FREDERICK SUPERINTENDENT OF THE STREET LIGHTING AND TRAFFIC CONTROL DEPARTMENT.
5. ALL BRANCH CIRCUIT CONDUCTORS TOO LARGE TO BE INSTALLED TO CIRCUIT BREAKER TERMINALS SHALL HAVE COPPER PIFTAIL ADAPTERS INSTALLED. ILSCO #C.P.M. OR APPROVED EQUAL.
6. ALL PANELS, CONTACTORS, BREAKERS AND CABINET SHALL BE SIZED TO MEET CIRCUITRY NEEDS (DRAWING REPRESENTS MINIMUM TYPICAL).
7. MAIN BREAKER PANEL SHALL BE INTERIOR ONLY. 100 AMP PANEL SHALL BE OVER WITH NEUTRAL BAR.
8. ALL WIRING SHALL BE OPEN USING TIE WRAPS TO SECURE WIRING IN A PROFESSIONAL MANNER.
9. ALL ITEMS TO BE AS INDICATED OR APPROVED EQUAL.
10. ALL BREAKERS SHALL BE BOLT ON TYPE.
11. ALL ARM SHALL MEET SHA SPECIFICATION



OUTSIDE
(CLOSED RIGHT SIDE)
NTS

INSIDE
(OPEN RIGHT SIDE)
NTS

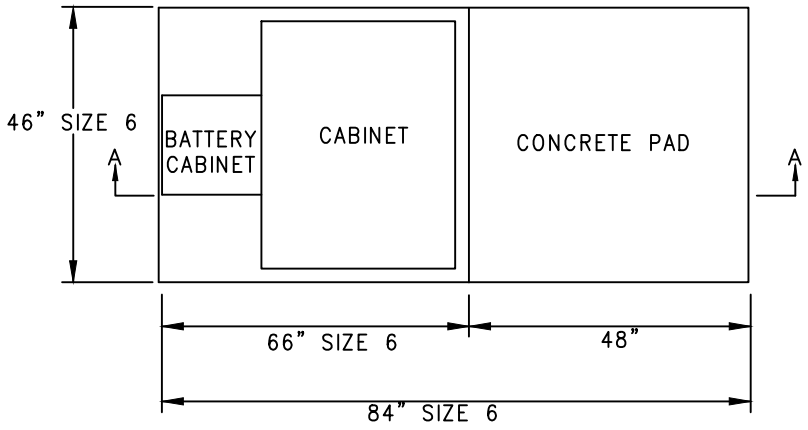
The City of Frederick Maryland

TRAFFIC SIGNAL & STREET LIGHTING COMBINATION-TYPE "P-44"

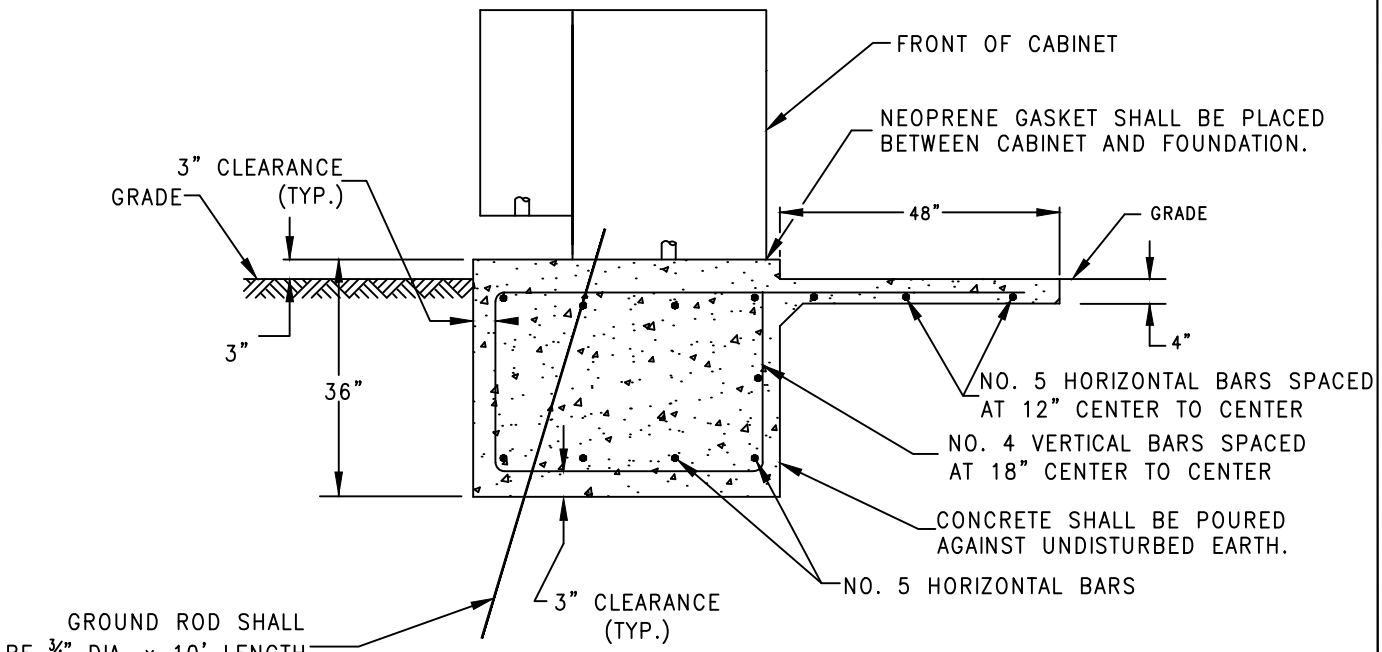
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

T-1.0

MARCH 2017



PLAN VIEW
NTS



SECTION A–A
NTS

NOTE:

IF CABINET DOOR FACES EXISTING OR PROPOSED SIDEWALK AREA, DELETE STANDING PAD PORTION OF FOUNDATION.

The City of Frederick Maryland

FOUNDATION DETAILS FOR BASE MOUNTED SIGNAL CABINETS

T-1.1

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

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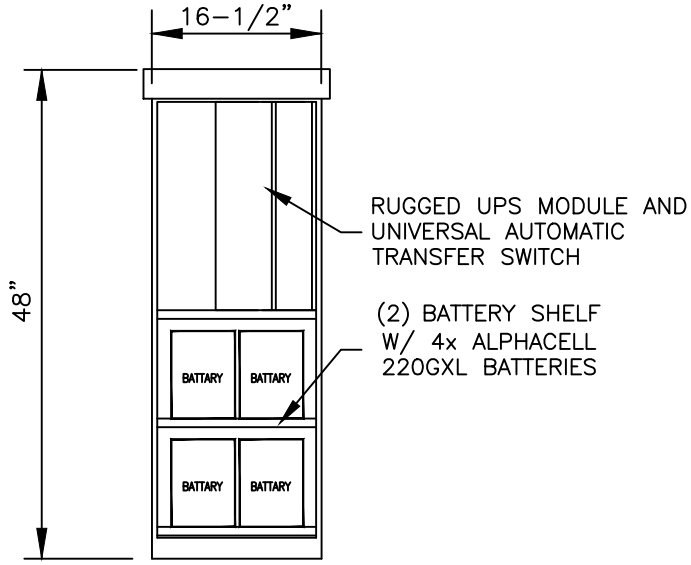
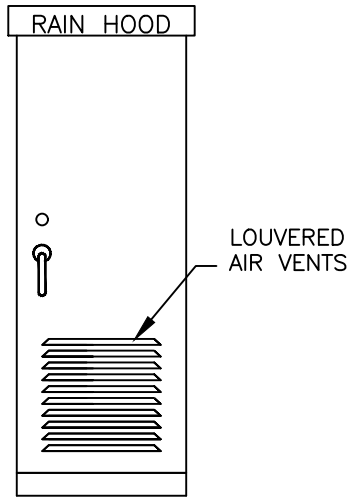
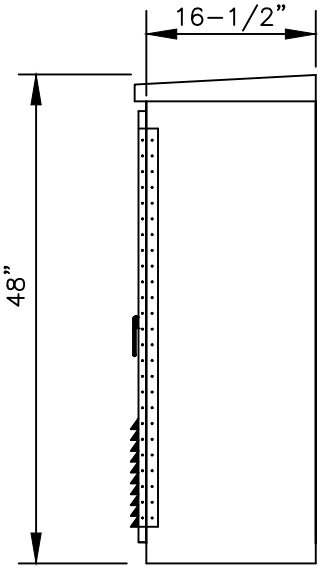


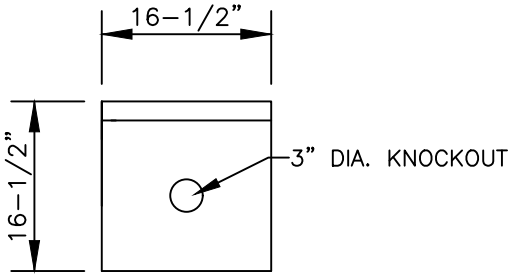
FRONT
(OPEN VIEW)
NTS



FRONT
(CLOSED VIEW)
NTS



SIDE
NTS



MOUNT TO POLE
OR
STREET LIGHT CABINET

BOTTOM
NTS

NOTES:

1. BATERY BACKUP CABINET TO BE ALPHA S6 OUTDOOR ENCLOSURE
2. TRANSFER SWITCH TO BE ALPHA MODEL UATS, 120V/30A
3. RUGGED UPS MODULE TO BE ALPHA FXM1100 UPS
4. THIS DETAIL IS FOR REFERENCE PURPOSES ONLY, PLEASE CONTACT THE FREDERICK CITY STREET LIGHTING DEPT. PRIOR TO INSTALLATION AT 301–600–1167.

The City of Frederick Maryland

FOUNDATION DETAILS FOR BASE MOUNTED SIGNAL CABINETS

T-1.2

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

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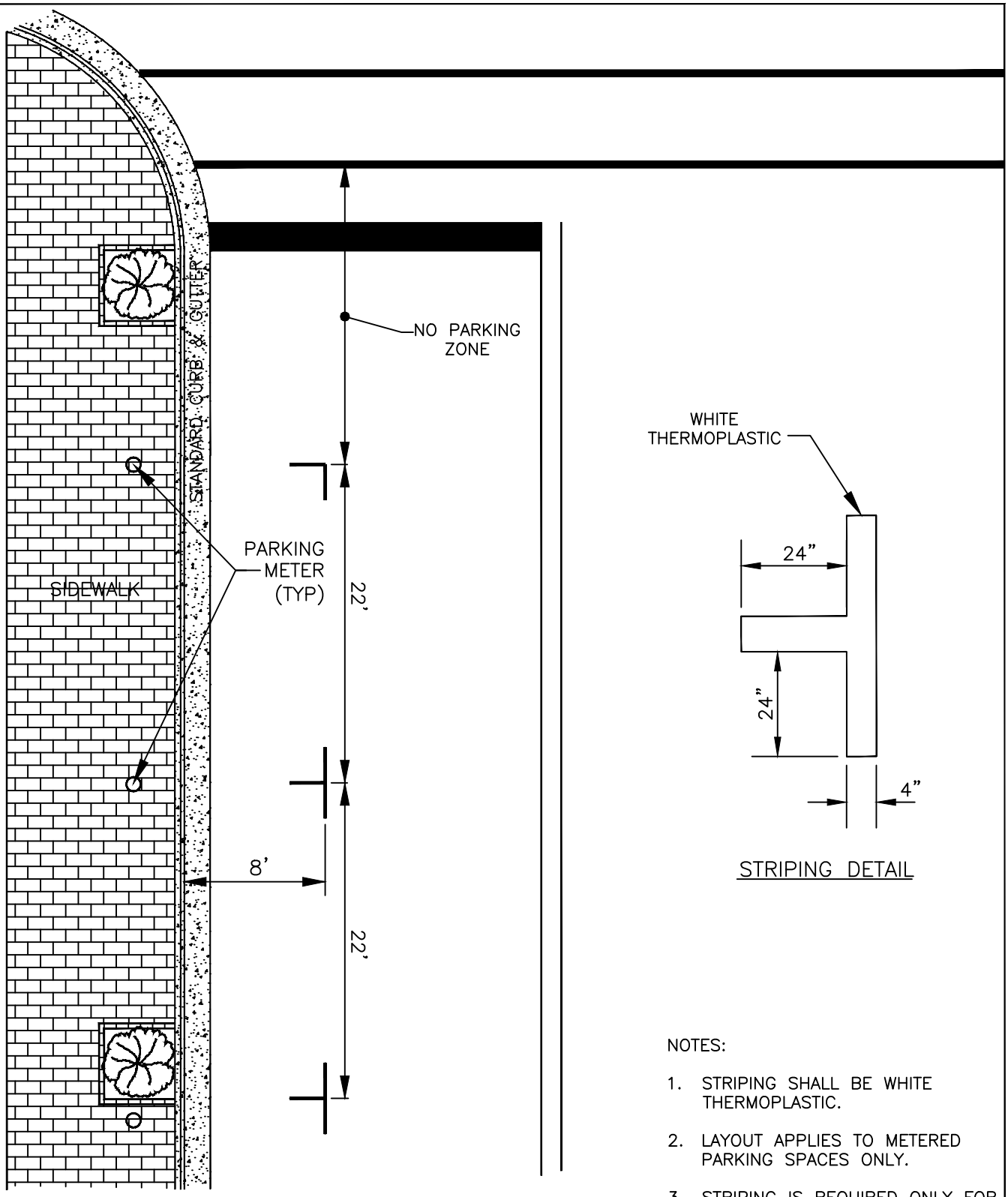


STRIPING DETAIL

NOTES:

1. STRIPING SHALL BE WHITE THERMOPLASTIC.
2. LAYOUT APPLIES TO METERED PARKING SPACES ONLY.
3. STRIPING IS REQUIRED ONLY FOR DOWNTOWN BUSINESS DISTRICT

PARALLEL PARKING STRIPING
NTS

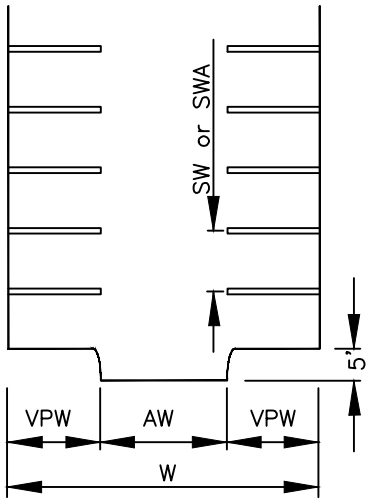
The City of Frederick Maryland

PARALLEL PARKING STRIPING LAYOUT

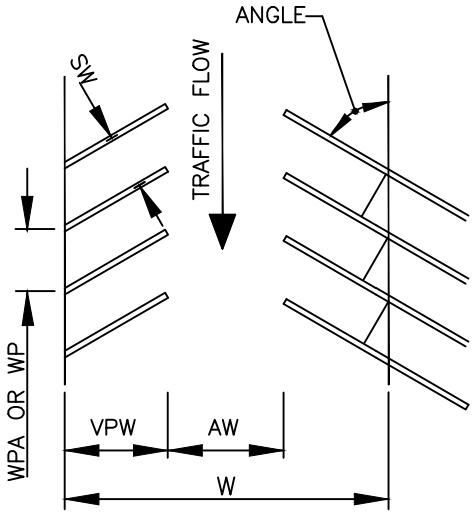
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

T-2.0

MARCH 2017



90° PARKING
NTS



ANGLED PARKING
NTS

AW	AISLE	24.0'
SW	STALL WIDTH	9.0'
VPW	STALL DEPTH	18.0'
SWA	HC STALL WIDTH	16.0'
W	TOTAL WIDTH	60.0'

	STANDARD	75°	60°	45°
AW	AISLE WIDTH	22.0'	20.0'	19.0'
SW	STALL WIDTH	9.0'	9.0'	9.0'
VPW	STALL DEPTH	17.0'	16.0'	15.0'
WP	STALL SPACING	9.32'	10.39'	12.6'
WPA	HC STALL SPACING	16.54'	18.48'	22.63'
W	TOTAL WIDTH	56.0'	52.0'	49.0'

NOTES:

1. ACCESSIBLE SPACE WIDTHS SHALL INCLUDE ACCESS AISLES PER ADA STANDARDS FOR ACCESSIBLE DESIGN, CHAPTER 5.

2. PARKING LAYOUTS SHALL ACCOMODATE AN AASHTO P DESIGN VEHICLE EVERYWHERE. PARKING LAYOUTS SHALL ACCOMODATE AN AASHTO SU DESIGN VEHICLE WHERE TRASH TRUCKS OR FIRE LANES ARE ANTICIPATED.

3. PARKING LAYOUTS SHALL ACCOMODATE THE AASHTO DESIGN VEHICLE REPRRESENTING THE LARGEST DELIVERY VEHICLE ANTICIPATED.

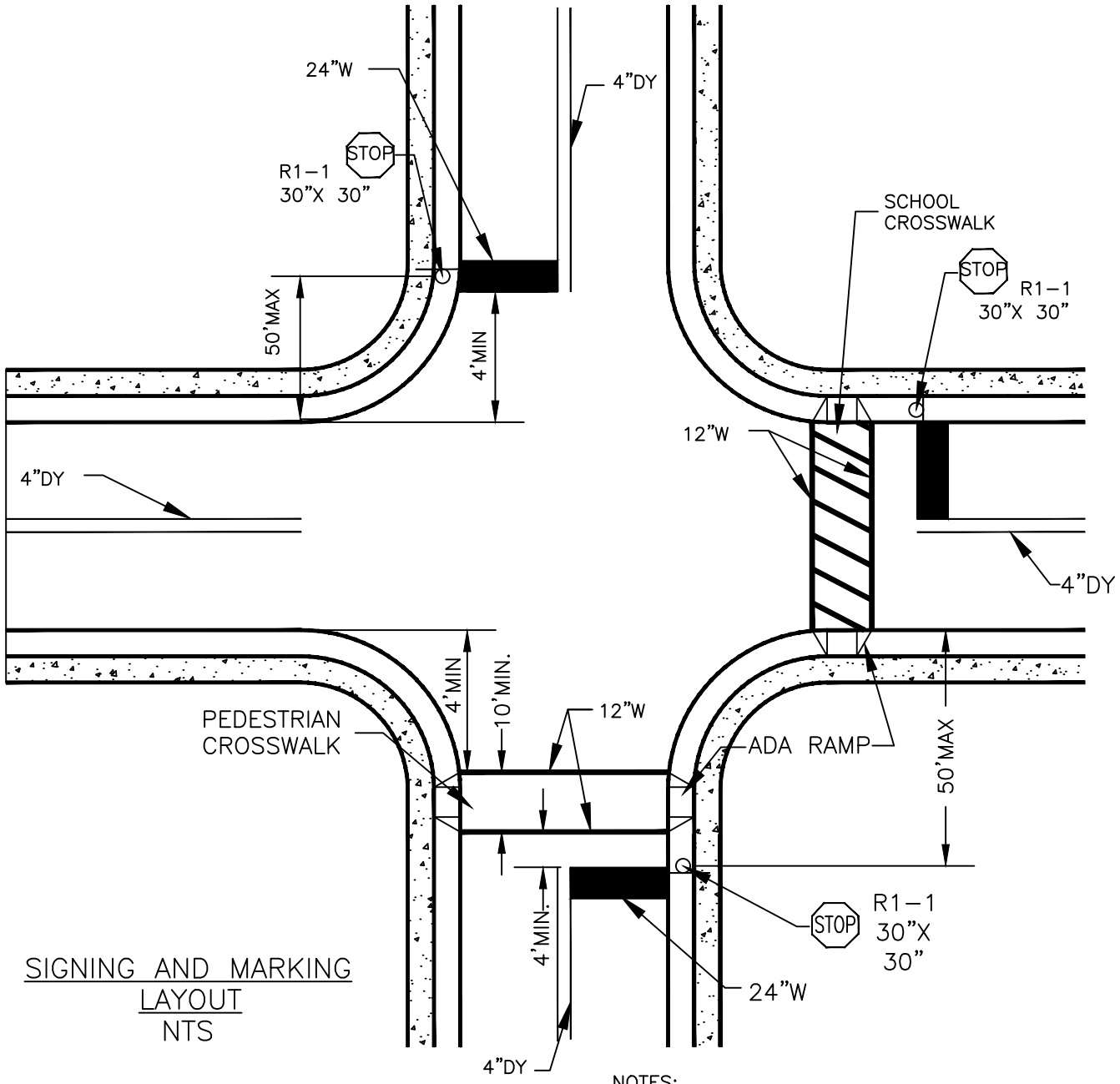
The City of Frederick Maryland

NON-RESIDENTIAL PARKING STRIPING & DIMENSIONS

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

T-3.0

MARCH 2017



SIGNING AND MARKING LAYOUT
NTS

LEGEND	
SYMBOL	DESCRIPTION
4"DY	4" THERMOPLASTIC DOUBLE YELLOW LINE
12"W	12" THERMOPLASTIC SOLID WHITE LINE CROSSWALK PAVEMENT MARKING
24"W	24" THERMOPLASTIC SOLID WHITE LINE STOP LINE PAVEMENT MARKING
—O—	TRAFFIC SIGN

NOTES:

1. CONSIDERATION OF A CROSSWALK SHOULD MEET THE LATEST MUTCD CROSSWALK SECTION STANDARDS AND GUIDANCE.
2. DIAGONAL LINES SHALL ONLY BE CONSIDERED FOR SCHOOL CROSSINGS OR ALONG IDENTIFIED SCHOOL WALKING ROUTES. DIAGONAL LINES SHALL BE PLACED FROM BOTTOM LEFT TO TOP RIGHT FROM POINT–OF–VIEW OF ONCOMING TRAFFIC TO INTERSECTION.
3. LAYOUT SHOULD BE IN ACCORDANCE WITH MUTDC & ADA REQUIREMENTS AND APPROVED BY CITY ENGINEER.

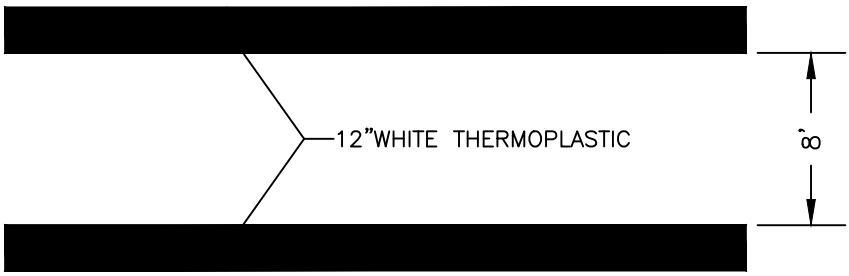
The City of Frederick Maryland

INTERSECTION SIGNING & MARKING LAYOUT

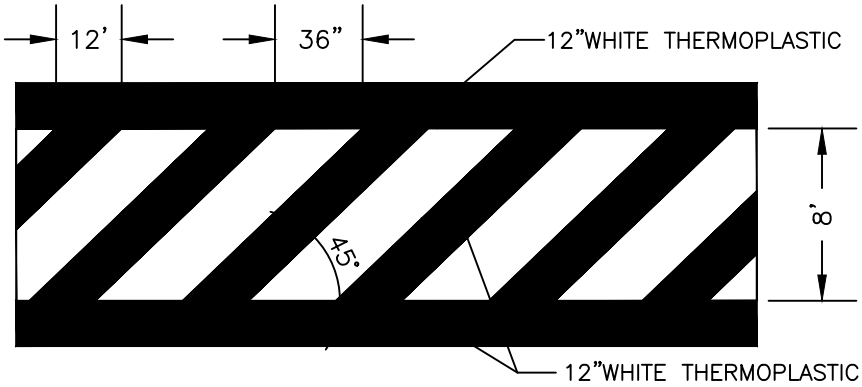
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

T-4.0

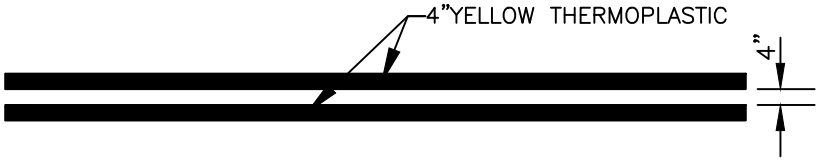
MARCH 2017



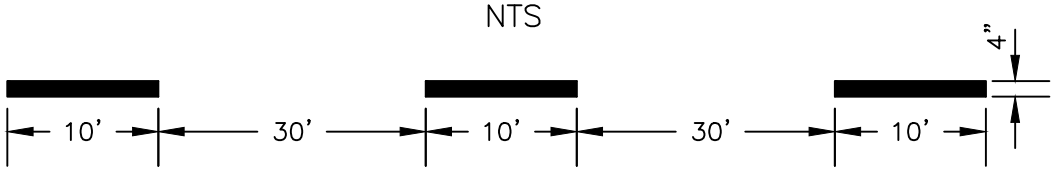
PEDESTRIAN CROSSWALK
NTS
NOTE: CONSIDERATION OF A CROSSWALK SHOULD MEET MUTCDSECTION 3B.18 STANDARDS AND GUIDANCE.



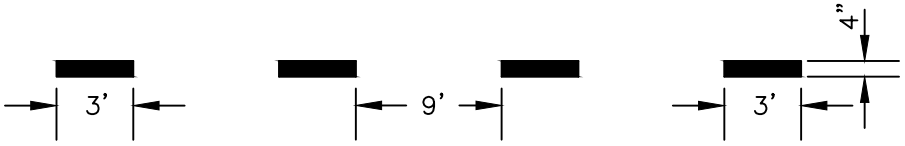
SCHOOL CROSSWALK
NTS
NOTE: DIAGONAL LINES SHALL ONLY BE CONSIDERED FOR SCHOOL CROSSINGS OR ALONG IDENTIFIED SCHOOL WALKING ROUTES. DIAGONAL LINES SHALL BE PLACED FROM BOTTOM LEFT TO TOP RIGHT FROM POINT–OF–VIEW OF ONCOMING TRAFFIC TO INTERSECTION.



DOUBLE YELLOW LINE
NTS



BROKEN WHITE LINE
NTS



DOTTED WHITE LINE
NTS

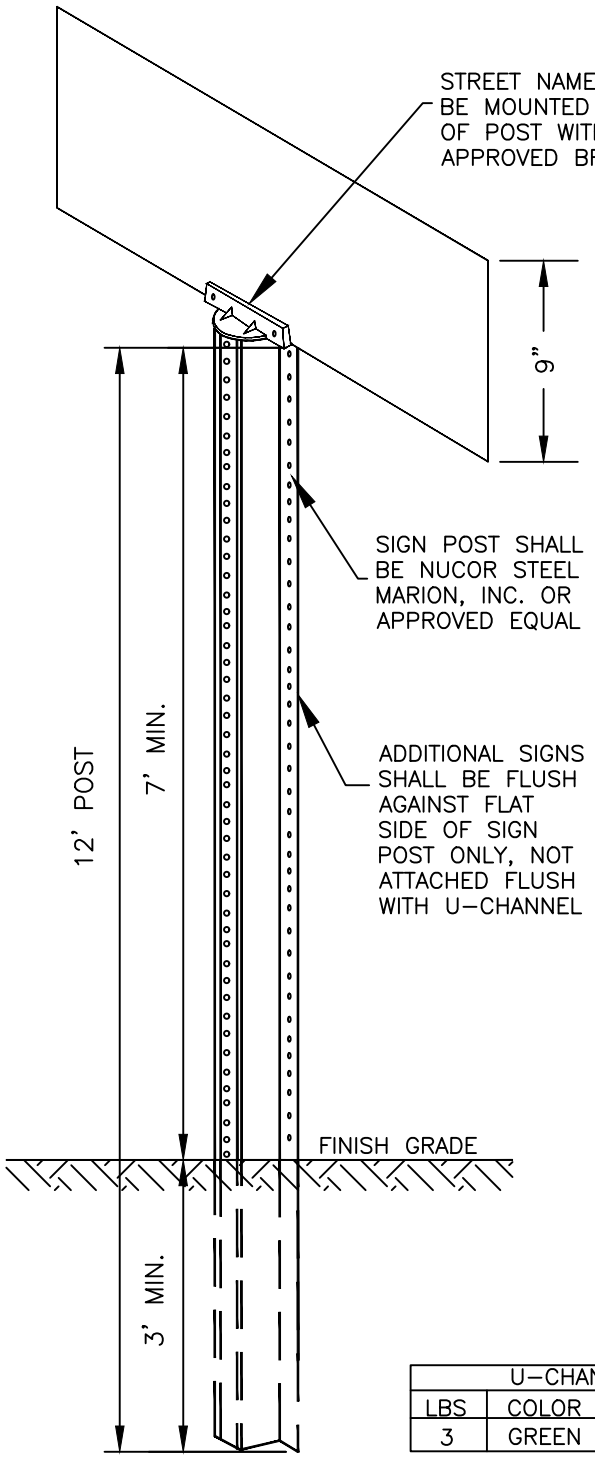
The City of Frederick Maryland

PAVEMENT MARKING DETAILS

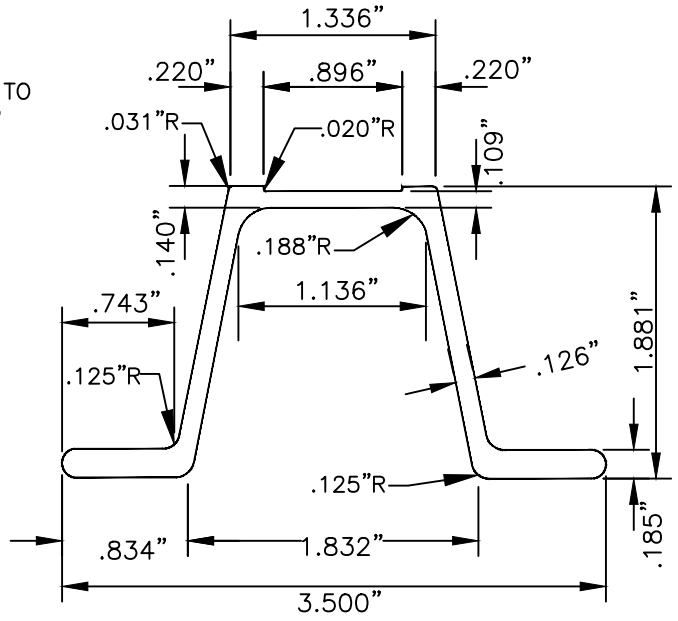
T-5.0

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

MARCH 2017



NTS



WITH 3/8"ø HOLE
AREA=.840 SQ. IN.

X-X AXIS	Y-Y AXIS
Ixx=.376	Iyy=.837
Sx=.340	Sy=.478

WITH 10mm"ø HOLE
AREA=.837 SQ. IN.

X-X AXIS	Y-Y AXIS
Ixx=.373	Iyy=.837
Sx=.336	Sy=.478

NO HOLE
AREA=.880 SQ. IN.

X-X AXIS	Y-Y AXIS
Ixx=.417	Iyy=.837
Sx=.393	Sy=.478

U-CHANNEL POST		
LBS	COLOR	SIZE
3	GREEN	1/2"X 1/4"X 5"

NOTES

1. SIGN POST SHALL BE NUCOR STEEL MARION, INC. OR APPROVED EQUAL
2. DETAILS ARE NOT TO SCALE.
3. 12' POST TO BE DRIVEN INTO GROUND WITH NO SPLICES.
4. FOR ADDED HEIGHT TO SIGN, BOLT 3LB POST TO FRONT SIDE OF THE POST DRIVEN IN GROUND.

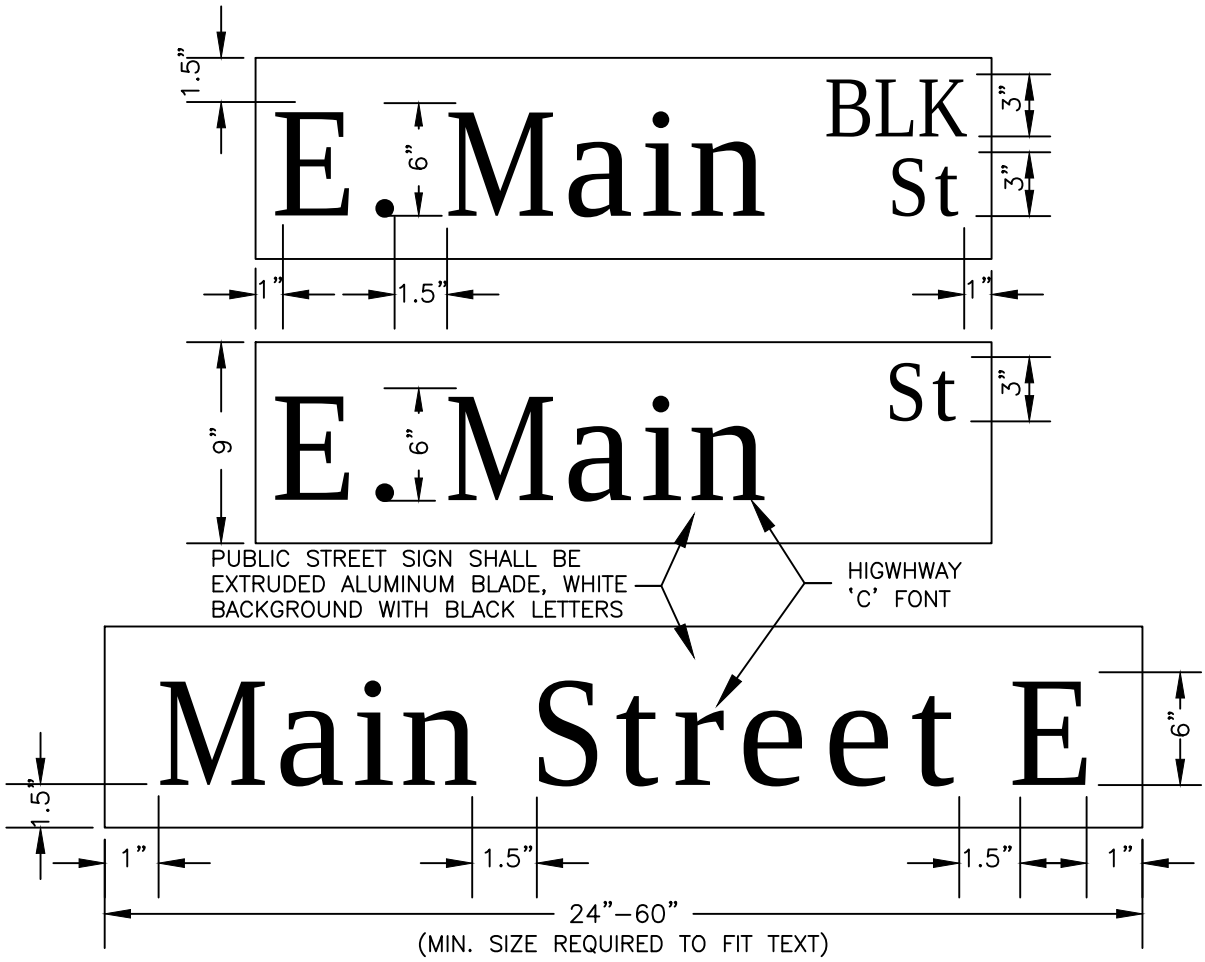
The City of Frederick Maryland

3 LB. POST & INSTALLATION

APPROVED: _____
DIRECTOR-DEPARTMENT PUBLIC WORKS

T-6.0

MARCH 2017



NTS

NOTES:

1. REFER TO FHWA AND/OR SHA MUTCD LATEST EDITIONS FOR SIGN INSTALLATION.
2. PRIVATE STREET NAMES SHALL BE GREEN BACKGROUND WITH WHITE LETTERS.
3. LENGTH OF SIGN TO BE DETERMINED BY NAME LENGTH, USE SHORTEST LENGTH TO ACCOMMODATE NAME.
4. THE LETTERING FOR NAMES OF STREETS AND HIGHWAYS ON STREET NAME SIGNS SHALL BE COMPOSED OF A COMBINATION OF LOWER–CASE LETTERS WITH INITIAL UPPER–CASE LETTERS. (SEE DETAIL ABV.)
5. USE PART NO. 1010 FOR 12" U–CHANNEL CAP BRACKET PART NO. 812 & 12" CROSSPIECE BRACKET.
6. ALL ROADWAY SIGNS MUST MEET FEDERAL AND STATE RETROREFLECTIVITY STANDARDS AS INDICATED IN THE MUTCD AND SHA'S STANDARD SPECIFICATION FOR CONSTRUCTION AND MATERIALS SECTION 950, LATEST EDITIONS.

STANDARD STREET ABBREVIATIONS	
NAME	ABBREVIATION
ALLEY	Alley
AVENUE	Ave
BOULEVARD	Blvd
CIRCLE	Cir
COURT	Ct
CROSSING	Crossing
DRIVE	Dr
GREEN	Green
LANE	Ln
PARKWAY	Pkwy
PIKE	Pike
PLACE	Pl
ROAD	Rd
STREET	St
SQUARE	Square
TERRACE	Terr
TRAIL	Trail
WAY	Way

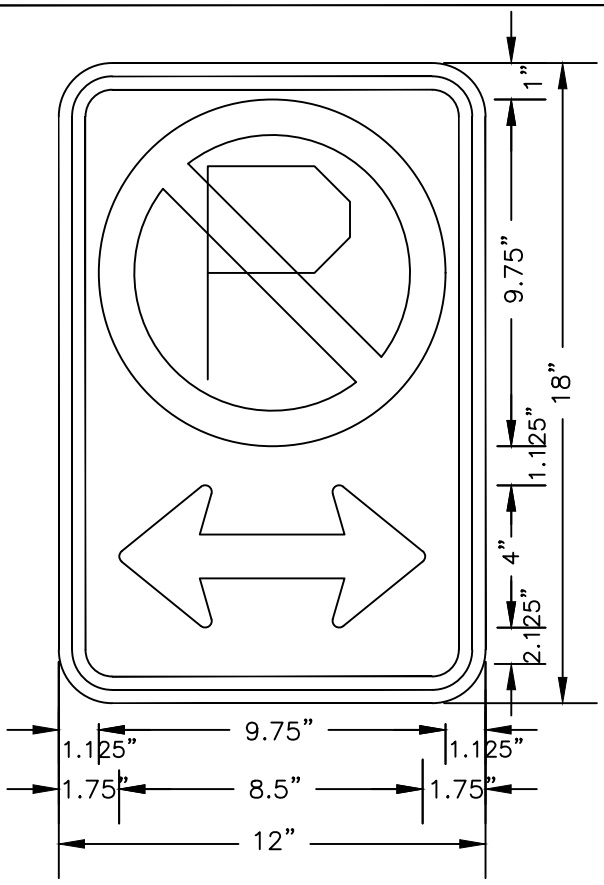
The City of Frederick Maryland

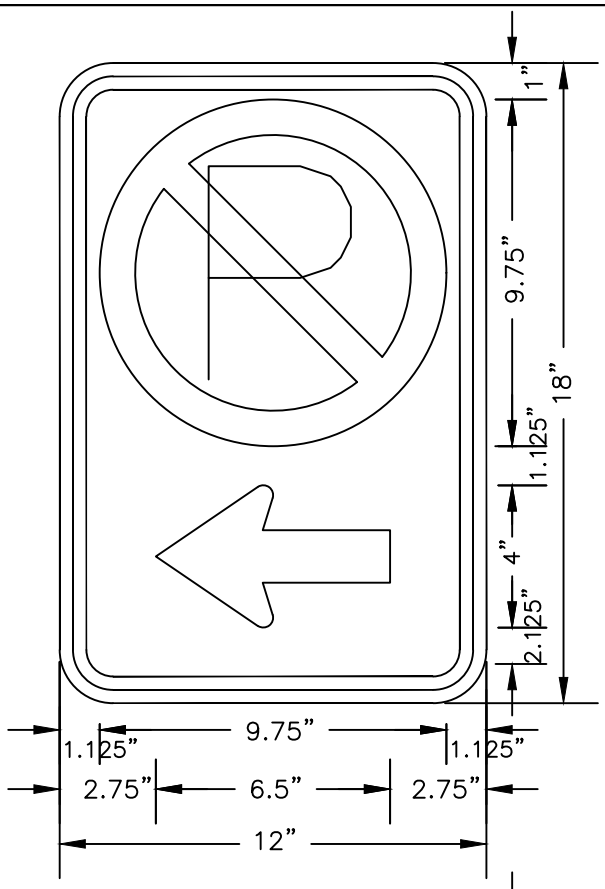
STREET NAME SIGNS

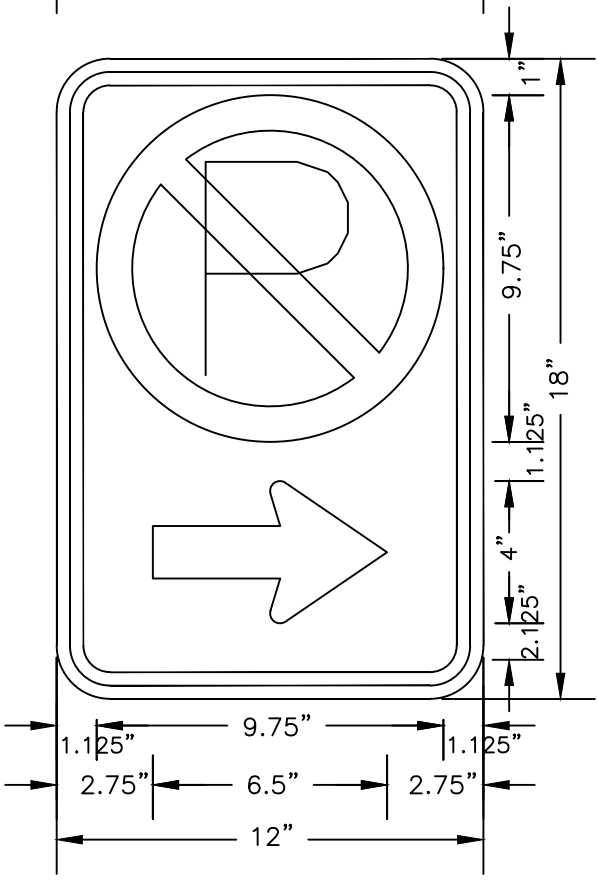
T-7.0

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

MARCH 2017







NOTES:

1. R7–2A; 1.500" RADIUS, 0.375" BORDER, 0.375" INDENT, RED ON WHITE;
2. TO BE MOUNTED TO CITY STANDARD SIGN POST. OR CITY LIGHT POLES
3. ALL OTHER SIGNS SHALL MEET MUTCD STANDARDS.
4. DETAILS ARE NOT TO SCALE.

The City of Frederick Maryland

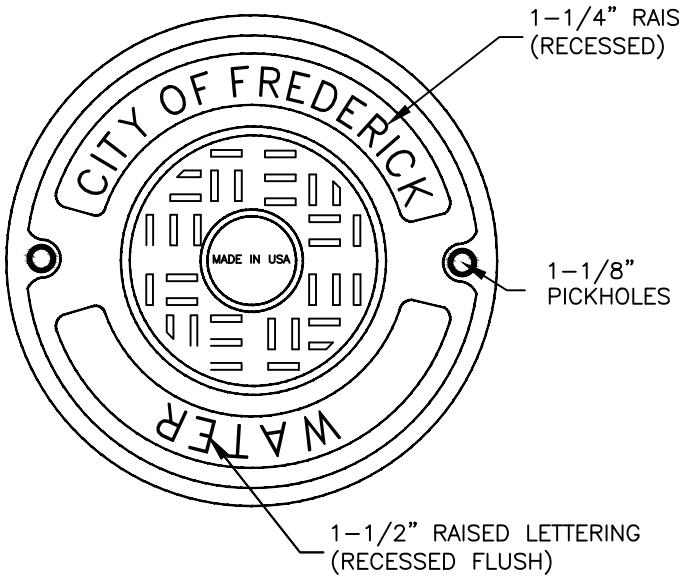
NO PARKING SIGNS

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

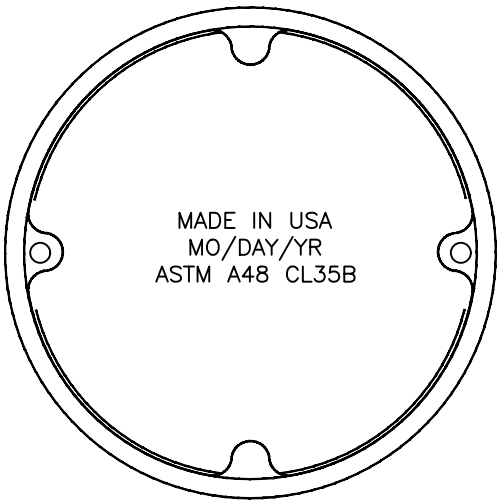
T-8.0

MARCH 2017

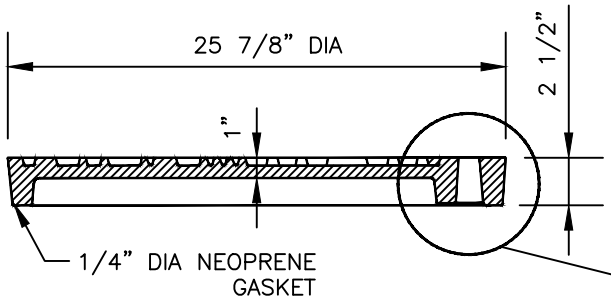
WATER DETAILS



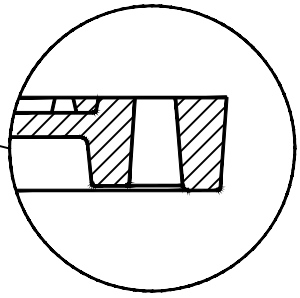
PLAN



BOTTOM VIEW



COVER SECTION



OPEN PICKHOLE VIEW

NOTES:

1. FRAME AND COVER TO BE EAST JORDAN IRON WORKS NO. NCR10–0039A OR APPROVED EQUAL.
2. MATERIAL TO BE CAST IRON ASTM A–48 CLASS 35B.
3. HEAVY DUTY MANHOLE FRAME AND COVER DESIGNED FOR H–20 LOADING: FRAME – (9") 250 LBS. COVER – 170 LBS.

The City of Frederick Maryland

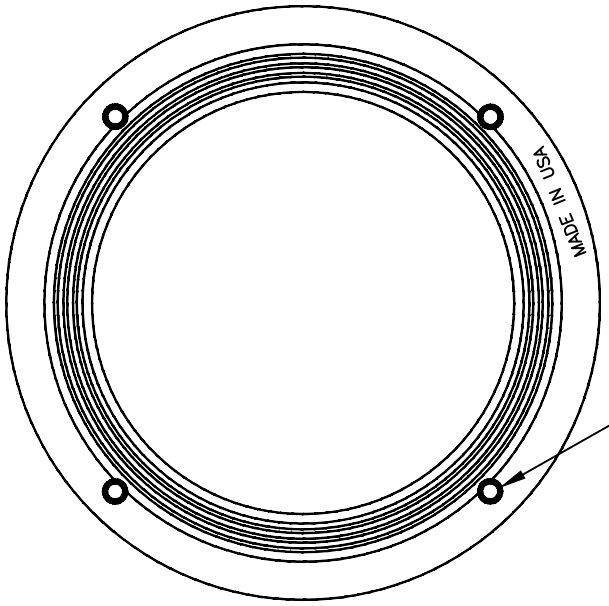
WATER MANHOLE COVER

APPROVED: Zachary J. Kershner

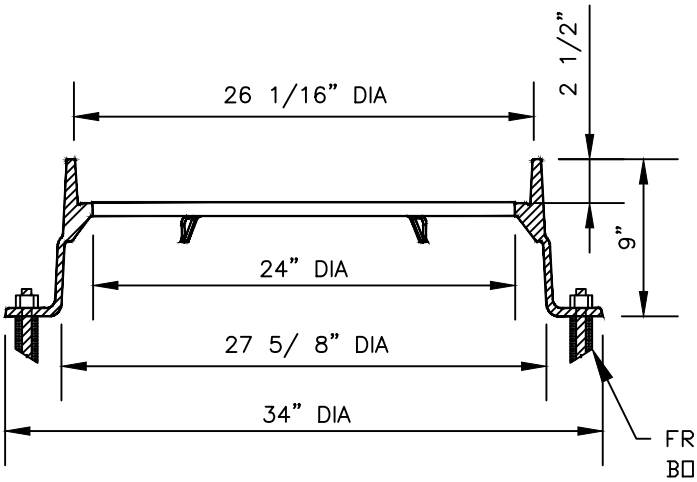
DIRECTOR–DEPARTMENT PUBLIC WORKS

W-1.0

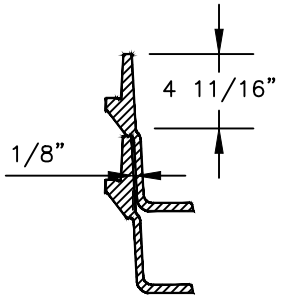
MARCH 2017



PLAN



SECTION



STACKING DETAIL

FRAME AND COVER SHALL BE BOLTED TO STRUCTURE USING $\frac{3}{4}$" GALVANIZED ALL-THREAD W/ ADHESIVE ANCHORING SYSTEM, SIMPSON STRONG TIE AT-XP, OR APPROVED EQUAL

NOTES:

1. FRAME TO BE EAST JORDAN IRON WORKS NO. 00154515 OR APPROVED EQUAL.
2. MATERIAL TO BE CAST IRON ASTM A-48 CLASS 35B.
3. HEAVY DUTY MANHOLE FRAME AND COVER DESIGNED FOR H-20 LOADING: FRAME - (9") 250 LBS. COVER - 170 LBS.
4. FRAME TO BE FURNISHED WITH (4) 1" ø FLANGE HOLES LOCATED 90 DEGREES APART ON A 30-1/4" BOLT CIRCLE.
5. USE PRECAST CONCRETE GRADE RINGS TO BRING TO GRADE, 1' 0" MAXIMUM.

The City of Frederick Maryland

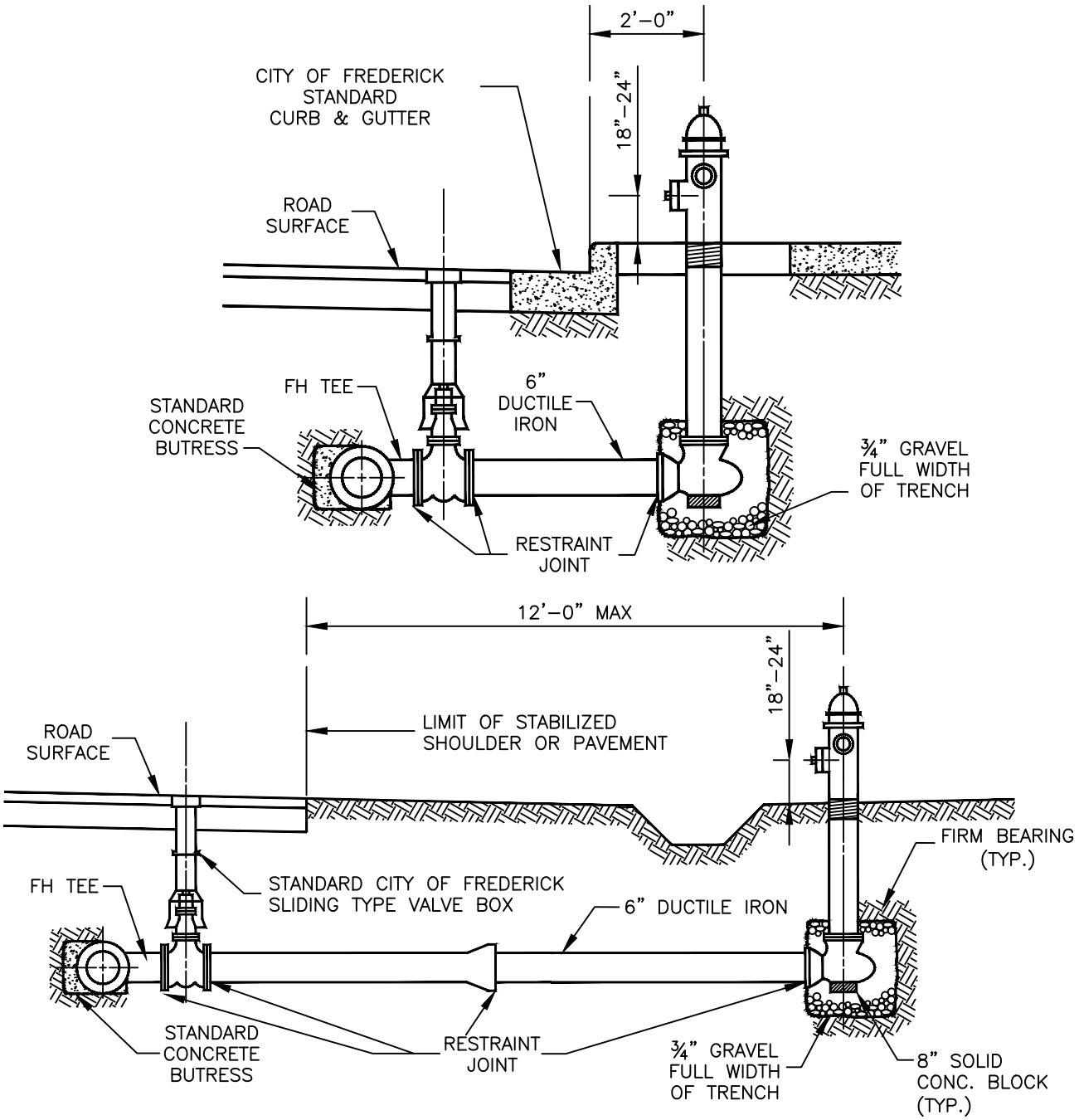
WATER MANHOLE FRAME

APPROVED: Zachary J. Kershner

DIRECTOR-DEPARTMENT PUBLIC WORKS

W-1.1

MARCH 2017



FIRE HYDRANT SETTING
N.T.S.

NOTES:

1. FIRE HYDRANT BARELL LENGTH AS NEEDED PER APPROVED PLANS. IF FIELD CONDITIONS REQUIRE EXTENSIONS, NO MORE THAN 2 EXTENSION SECTIONS PER HYDRANT SHALL BE PERMITTED.
2. STRAPPING OF FIRE HYDRANT TO VALVE WILL BE DETERMINED BY FIELD CONDITIONS.
3. ALL JOINTS SHALL BE RESTRAINED.

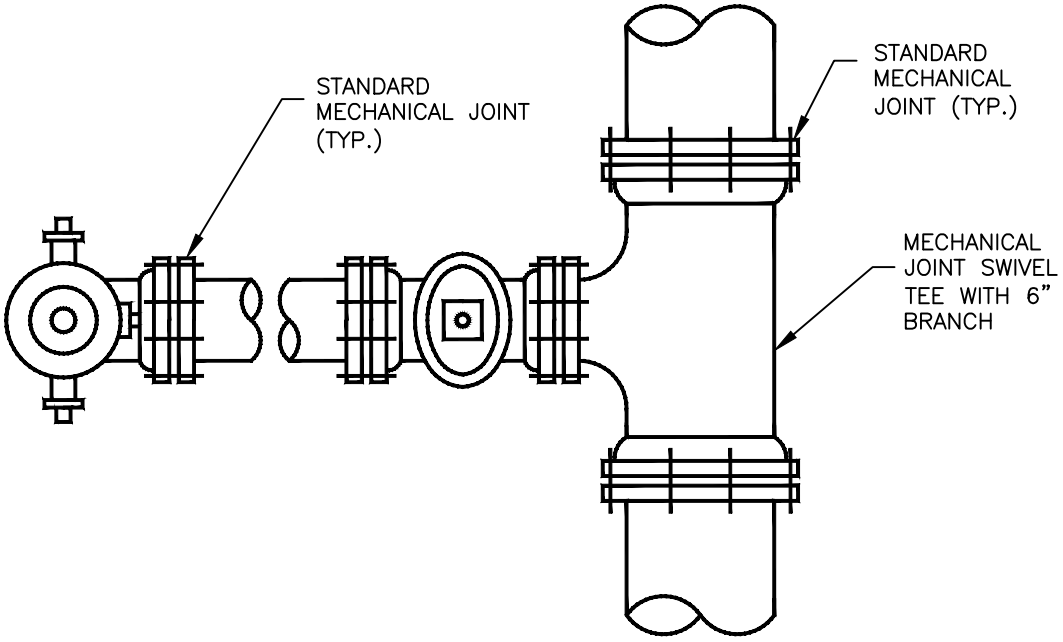
The City of Frederick Maryland

FIRE HYDRANT SETTING

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

W-2.0

MARCH 2017



FIRE HYDRANT STRAP TEE
N.T.S.

NOTES:

1. MECHANICAL JOINT VALVE AND HYDRANT TEES AND CONNECTING PIECES SHALL BE USED FOR ANCHORING MECHANICAL JOINT VALVES AND HYDRANTS TO THE PIPE MAIN. THESE HYDRANT FITTINGS WITH INTEGRALLY ATTACHED GLANDS SHALL EFFECTIVELY RESTRAIN JOINT FROM SEPARATION.

2. JOINT CONNECTION SHALL BE MADE WITH STANDARD MECHANICAL JOINT BOLTS AND GASKETS. TIE RODS ARE NOT REQUIRED.

3. GLANDS SHALL ROTATE ON TEE BRANCHES AND ONE END OF CONNECTION PIECES TO FACILITATE VERTICAL SETTING OF VALVES AND HYDRANT IN SLOPING TERRAIN.

4. HYDRANT TEES AND CONNECTING PIECES SHALL BE DUCTILE IRON AND MEET ANSI A21.10 AND A21.11.

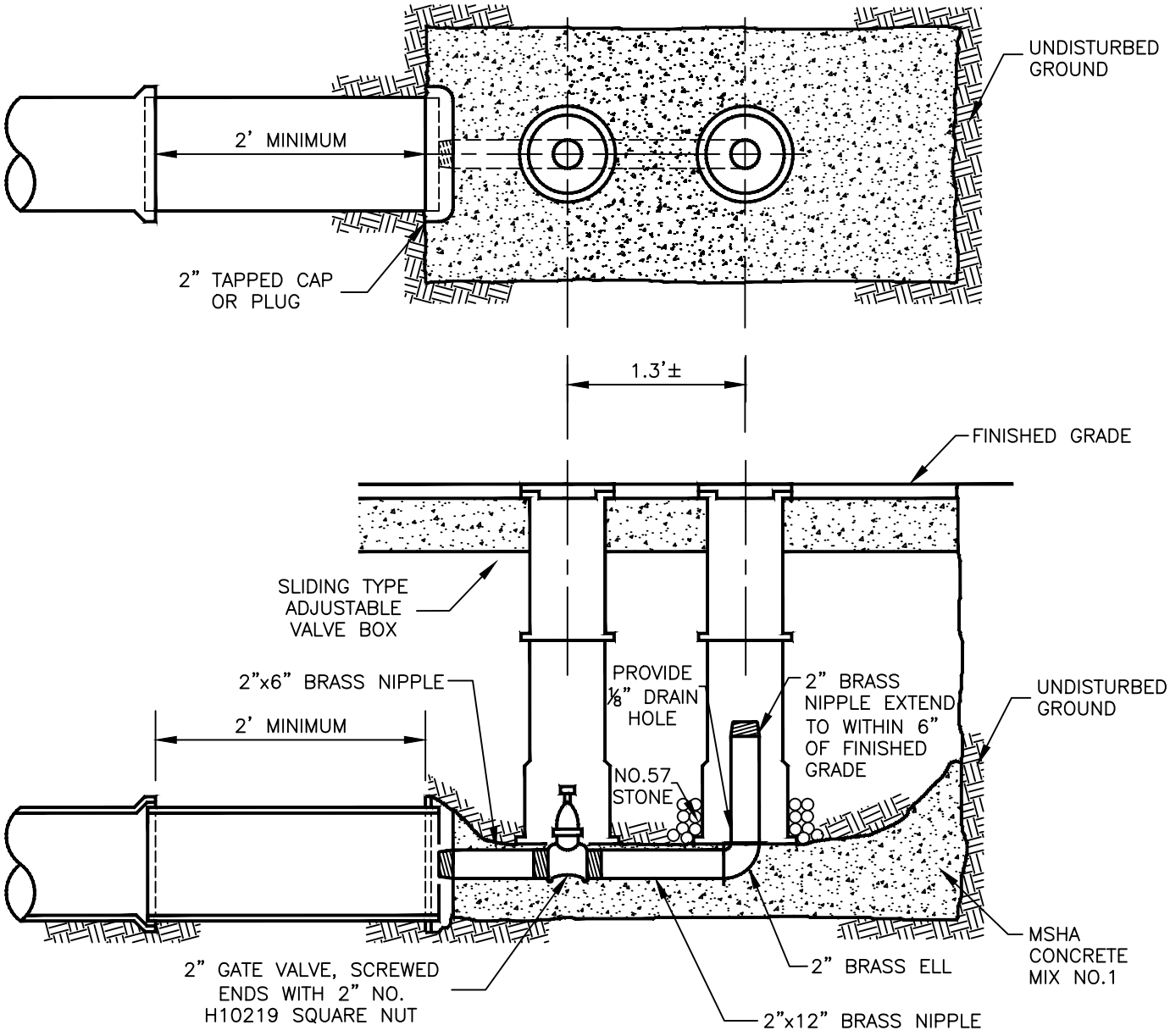
The City of Frederick Maryland

FIRE HYDRANT STRAP TEE

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

W-2.1

MARCH 2017



NOTE:

CAP AND BLOWOFF IS TO BE USED ONLY ON A TEMPORARY BASIS DURING CONSTRUCTION AND SHALL NOT BE PART OF FINAL DESIGN

The City of Frederick Maryland

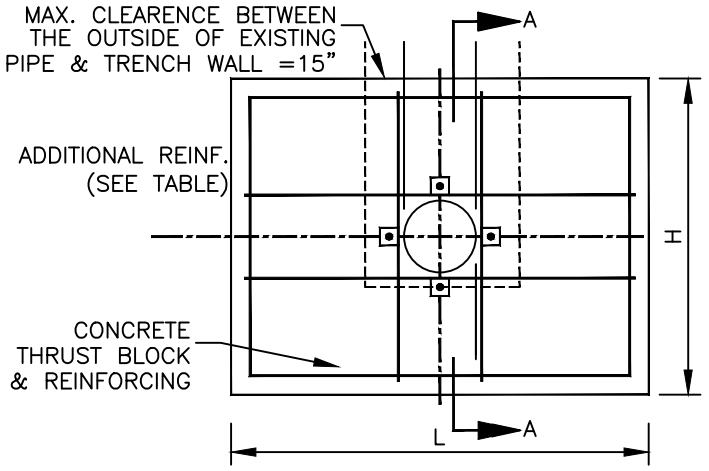
TEMPORARY CAP AND BLOWOFF (TEMPORARY ONLY)

W-3.0

APPROVED: _____

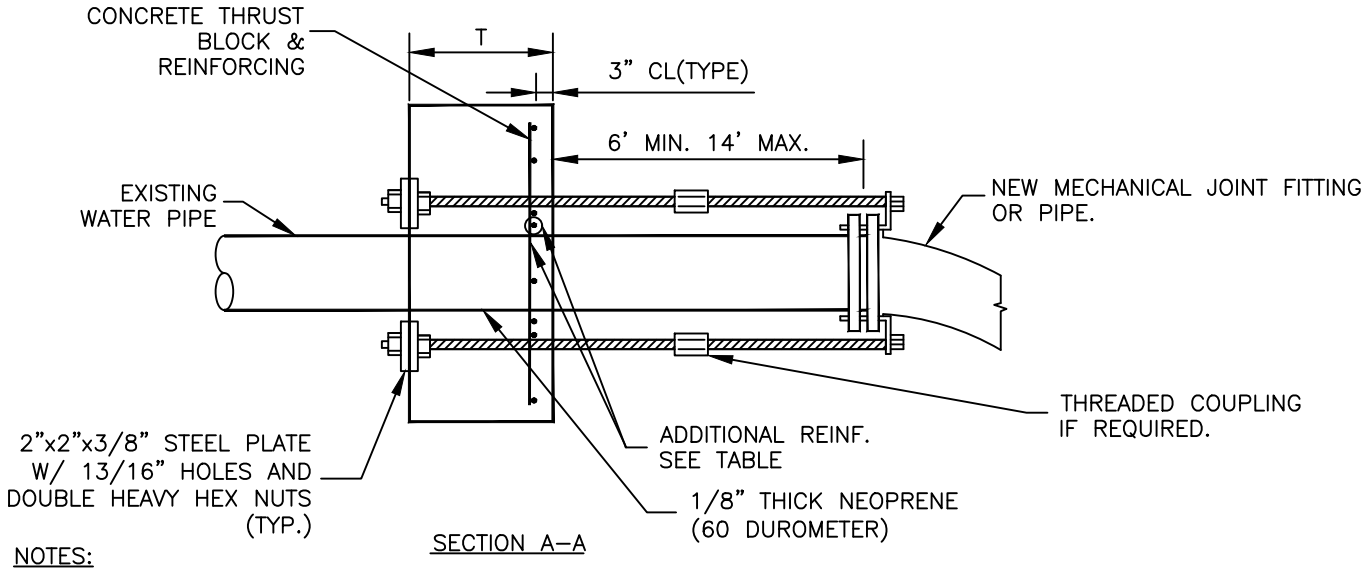
DIRECTOR–DEPARTMENT PUBLIC WORKS

MARCH 2017



ELEVATION

PIPE DIAMETER INCH	THRUST BLOCK DIMENSIONS			THRUST BLOCK REINF.
	T	H	L	
4", 6"	1'–2"	2'–6"	3'–6"	#5@12" C/C E.W. +4#5 ADD'L REINF.
8"	1'–2"	3'–0"	4'–0"	#5@12" C/C E.W. +4#5 ADD'L REINF.
10"	1'–4"	4'–0"	4'–0"	#5@12" C/C E.W. +4#5 ADD'L REINF.
12"	1'–4"	5'–0"	5'–0"	#5@12" C/C E.W. +4#5 ADD'L REINF.
14"	1'–4"	6'–0"	6'–0"	#5@12" C/C E.W. +4#5 ADD'L REINF.
16"	1'–6"	6'–0"	8'–0"	#5@12" C/C E.W. +4#5 ADD'L REINF.
18"	1'–6"	6'–0"	11'–0"	#5@12" C/C E.W. +4#5 ADD'L REINF.



SECTION A–A

NOTES:

1. ALL CONCRETE SHALL BE f'c=4000 PSI AT 28 DAYS. PIPELINE SHALL NOT BE PRESSURIZED UNTIL CONCRETE STRENGTH REACHES 4000 PSI. AND TRENCH HAS BEEN BACKFILLED.
2. ALL REBAR SHALL BE ASTM A615 GRADE 60.
3. STEEL PLATES SHALL BE ASTM A36.
4. MAINTAIN 2" CLEAR BETWEEN ALL REBAR AND PIPE.
5. COAT ALL EXPOSED STEEL WITH FIELD APPLIED BITUMINOUS COATING.
6. BOLT CIRCLE FOR ¾" TIE RODS AT THRUST COLLAR EQUAL BOLT CIRCLE AT TIE BOLTS.
7. TIE RODS SHALL BE PARALLEL TO AXIS OF PIPE.
8. TIE COUPLING, IF NECESSARY, SHALL BE STAR NATIONAL PRODUCTS SUPER STAR TIE COUPLING NO. SS10 OR APPROVED EQUAL.
9. IF WORKING PLUS SURGE PRESSURES ARE HIGHER THAN 250 PSI, SPECIAL DESIGN IS REQUIRED.
10. SPECIAL DESIGN IS REQUIRED FOR MAIN LARGER THAN 18 INCH.
11. DEPTH OF FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'–0". IF SHALLOWER, SPECIAL BLOCK DESIGN REQUIRED.
12. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF BLOCK. IF GROUNDWATER IS ABOVE BOTTOM OF BLOCK, SPECIAL BLOCK DESIGN REQUIRED.
13. SOFT OR ORGANIC SOIL CONDITIONS REQUIRE SPECIAL BLOCK DESIGN.
14. REPLACE ALL DISTURBED SOIL BETWEEN NEW FITTING AND CONCRETE COLLAR WITH CRUSHED STONE COMPACTED AS STRUCTURAL FILL. REFER TO TABLE ON W–6.0 FOR NUMBER OF REQUIRED BARS.

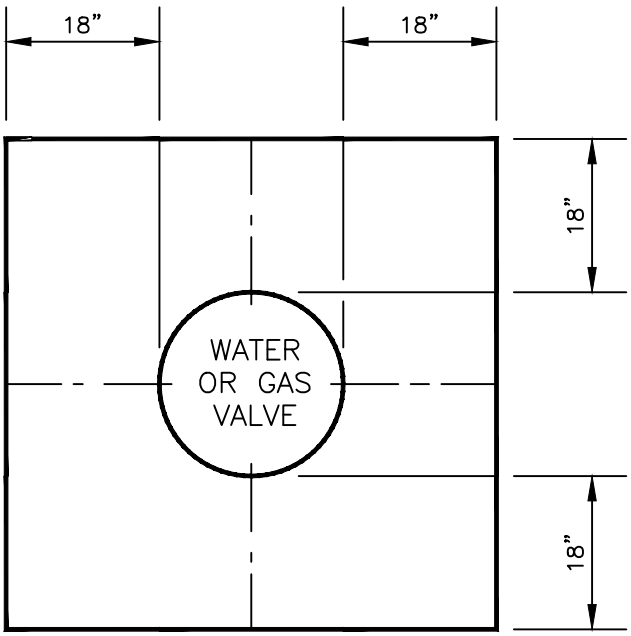
The City of Frederick Maryland

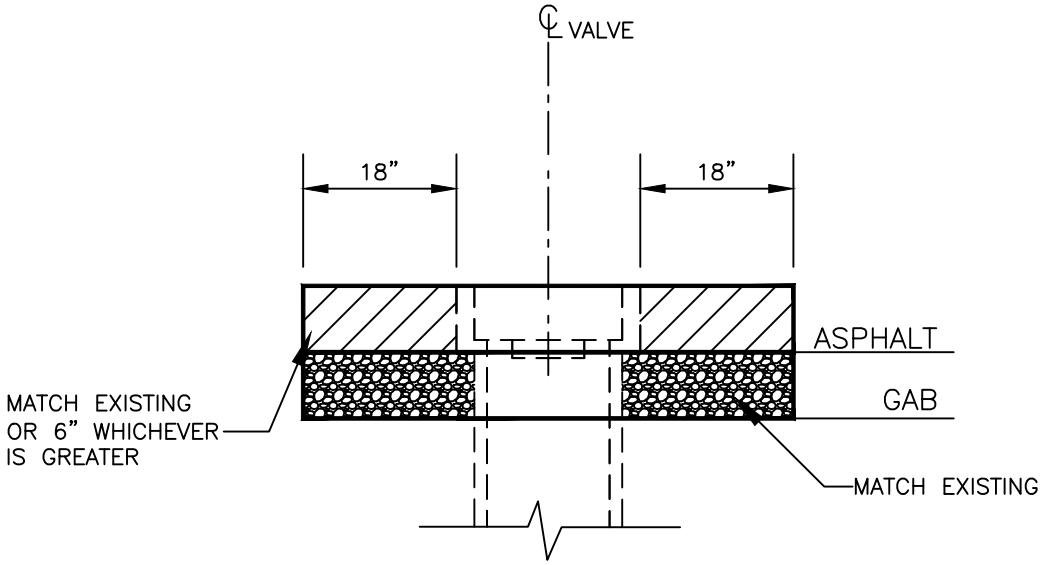
ANCHOR BLOCK

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

W-4.0

MARCH 2017





NOTES:

1. METHOD OF ADJUSTING WATER AND GAS VALVE BOXES IN ADVANCE OF PAVING
2. PRIOR TO PLACING ASPHALT, SUB-GRADE SHALL BE FIRMLY COMPACTED PER CITY OF FREDERICK SPECIFICATIONS.

The City of Frederick Maryland

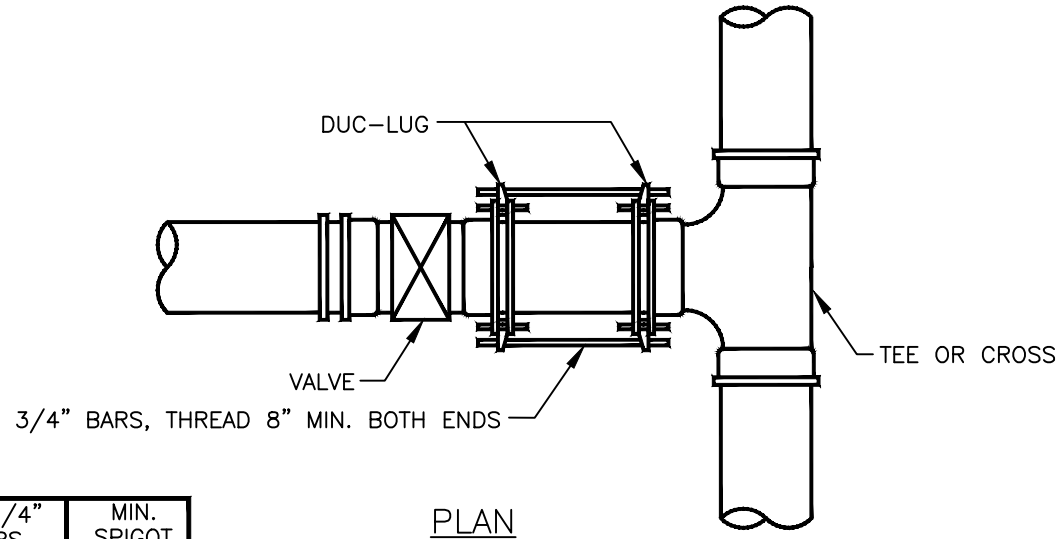
WATER/GAS VALVE ADJUSTMENT

APPROVED: Zachary J. Kershner

DIRECTOR–DEPARTMENT PUBLIC WORKS

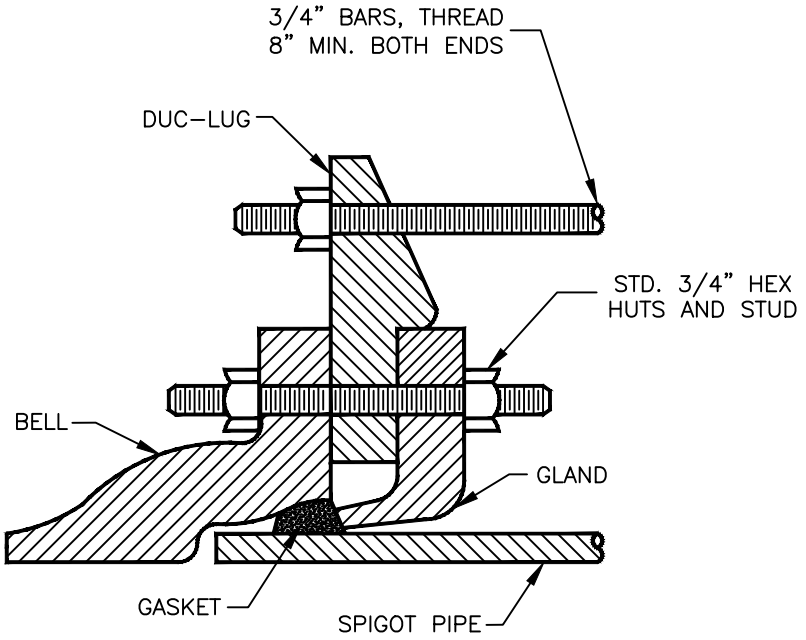
W-5.0

MARCH 2017



PLAN

VALVE SIZE	NO. OF 3/4" DIA. BARS REQUIRED	MIN. SPIGOT LENGTH
4"	2	27"
6"	2	27"
8"	2	27"
10"	4	27"
12"	6	27"
16"	8	36"
20"	12	36"
24"	16	36"
30"	20	36"



CROSS SECTION OF LUG ASSEMBLY

NOTES:

1. MECHANICAL JOINT FITTINGS ONLY SHALL BE USED.
2. ALL STEEL SHALL BE COATED WITH TWO COATS OF BITUMINOUS PAINT, CONFORMING TO MIL–P–23236P, CLASS 2.
3. IF TAPPING SLEEVE AND VALVE ARE USED, OMIT STRAPPING AND SPIGOT PIPE.
4. TIE BOLTS BY "STAR" METHOD ARE AN APPROVED EQUAL TO "DUC–LUGS" METHOD.

The City of Frederick Maryland

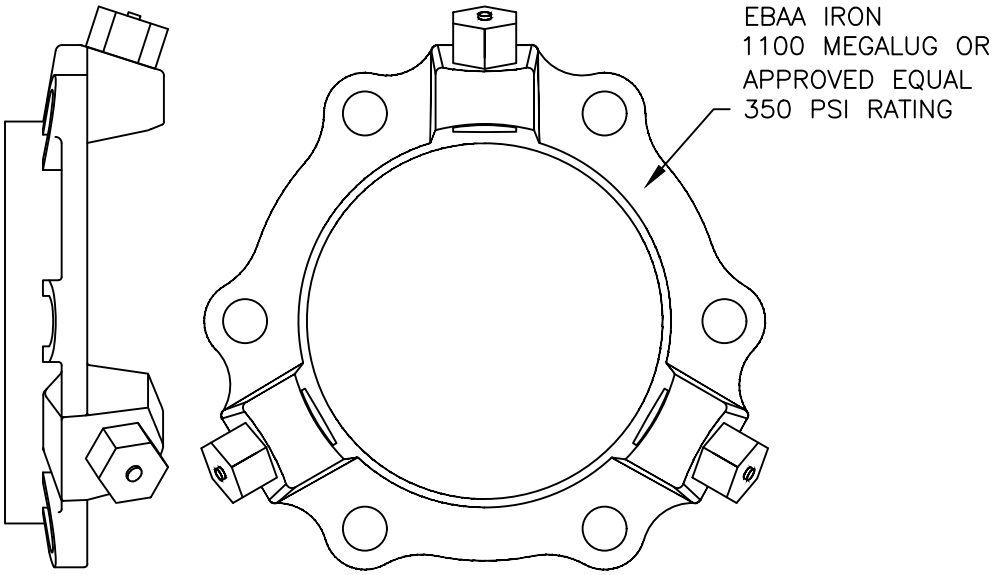
ANCHORING VALVE TO TEE WITH "DUC-LUGS" METHOD

APPROVED: Zachary J. Kearbey

DIRECTOR–DEPARTMENT PUBLIC WORKS

W-6.0

MARCH 2017



MECHANICAL JOINT FITTING FOR DUCTLIE IRON PIPE– 3"–48"

NOTES:

1. COATING WILL BE BLACK BITUMINOUS PAINT. MARKING WILL BE CAST AS REQUIRED.
2. ALL DUCTILE IRON MECHANICAL JOINTS FITTINGS WILL BE PRODUCED TO MEET ASTM A536 GRADE 80–55–06.
3. TORQUE WRENCH SHALL BE USED TO MEET MINIMUM MANUFACTURE TORQUE SPECIFICATIONS
4. USE RESTRAINT DISTANCES PER MANUFACTURER'S SPECS OR USE ANCHOR BLOCK.

The City of Frederick Maryland

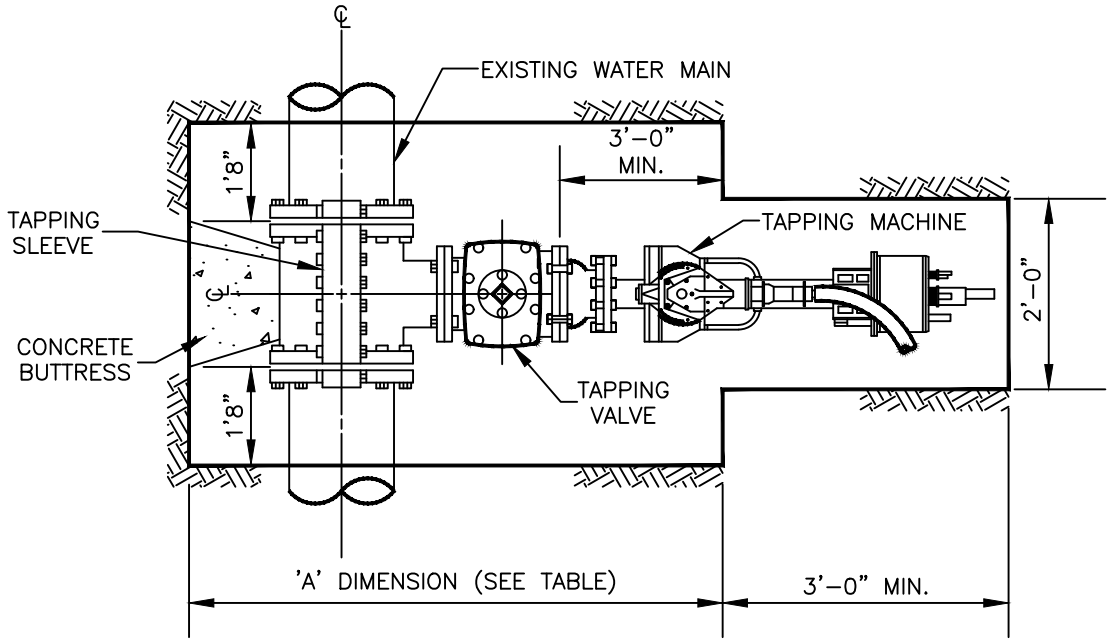
RETAINER GLAND

W-6.1

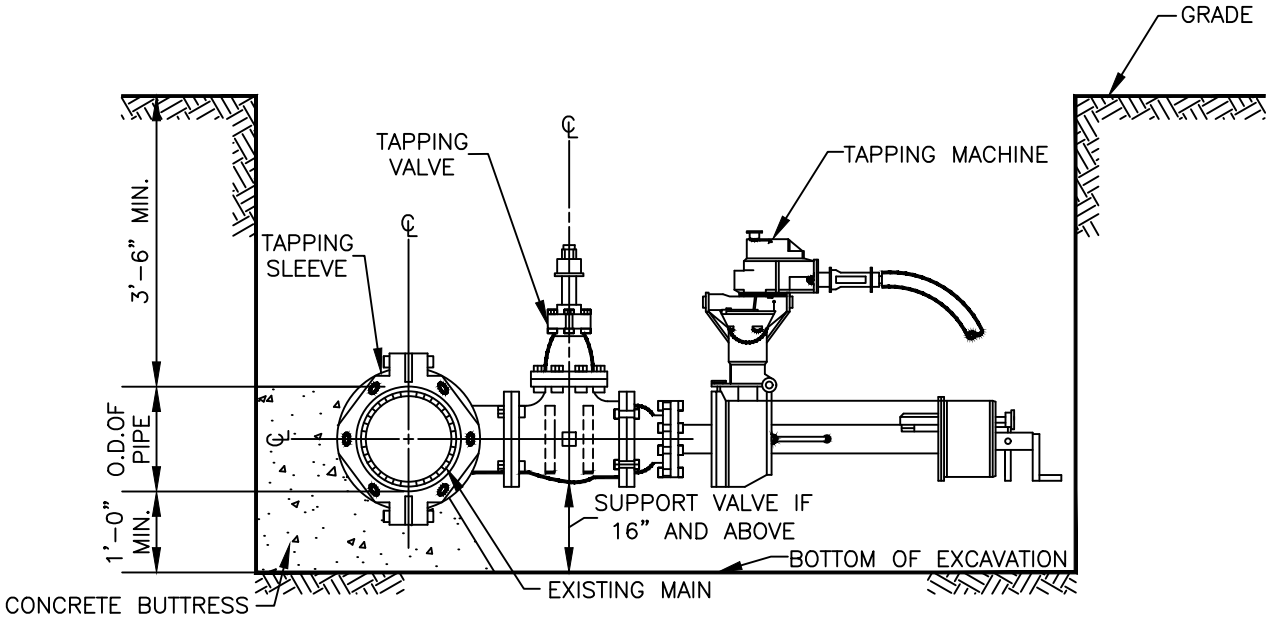
APPROVED: Zachary J. Kershner

DIRECTOR–DEPARTMENT PUBLIC WORKS

MARCH 2017



PLAN



ELEVATION

MAIN DIAMETER	4"	6"	8"	10"	12"	14"	16"	18"	20"
A (MINIMUM)	5'–10"	6'–3"	6'–6"	6'–9"	7'–0"	7'–2"	7'–8"	8'–3"	8'–6"

TABLE OF VALUES

The City of Frederick Maryland

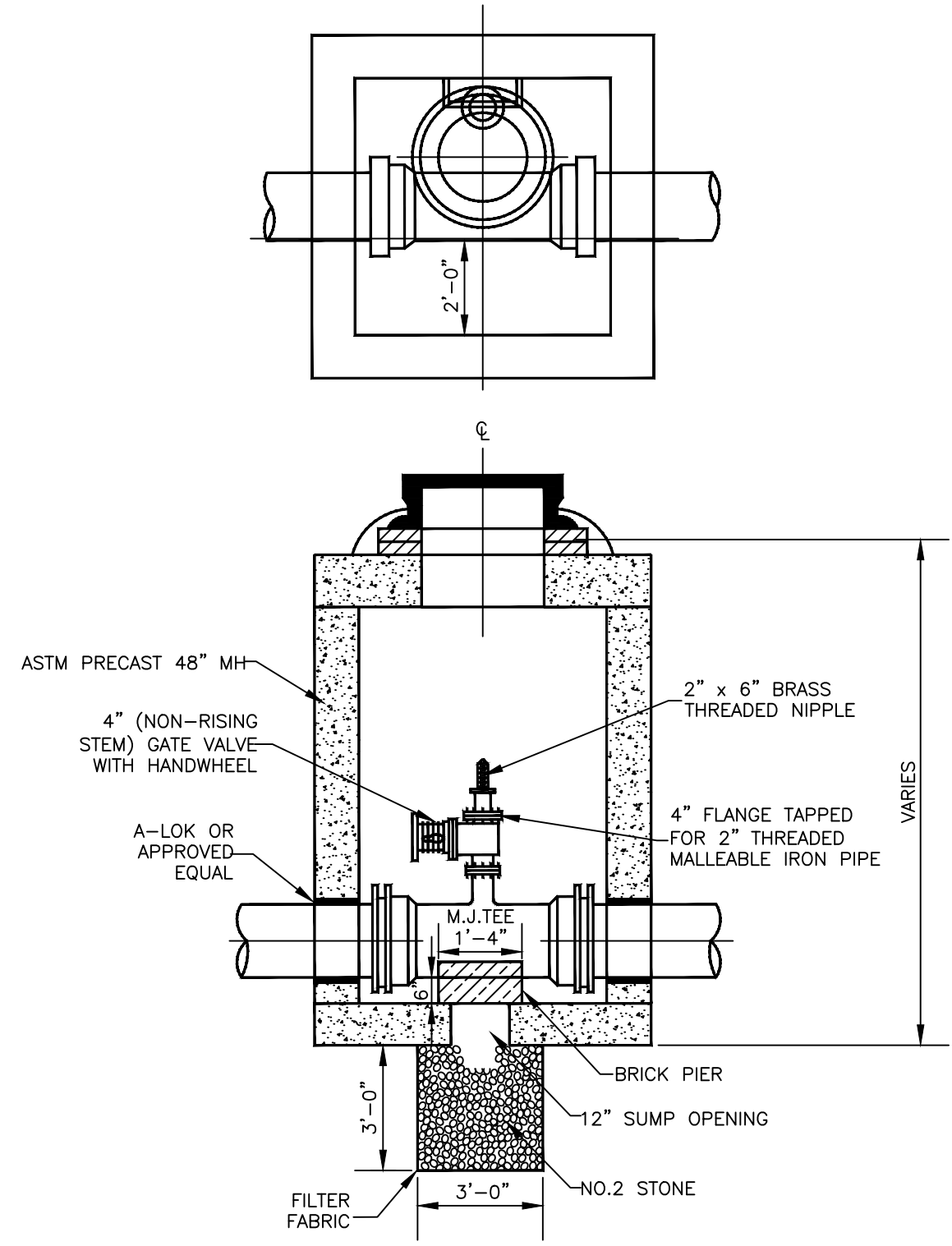
TAPPING SLEEVE AND VALVE EXCAVATION

APPROVED: Zachary J. Kershner

DIRECTOR–DEPARTMENT PUBLIC WORKS

W-7.0

MARCH 2017



NOTES:

1. ELIMINATE SUMP IF INSTALLED BELOW WATER TABLE.
2. MANHOLE FOR DEWATERING DEVICE CAN BE ROUND OR SQUARE STYLE
3. SIZE OF MANHOLE IS DETERMINED BY PIPE SIZE

The City of Frederick Maryland

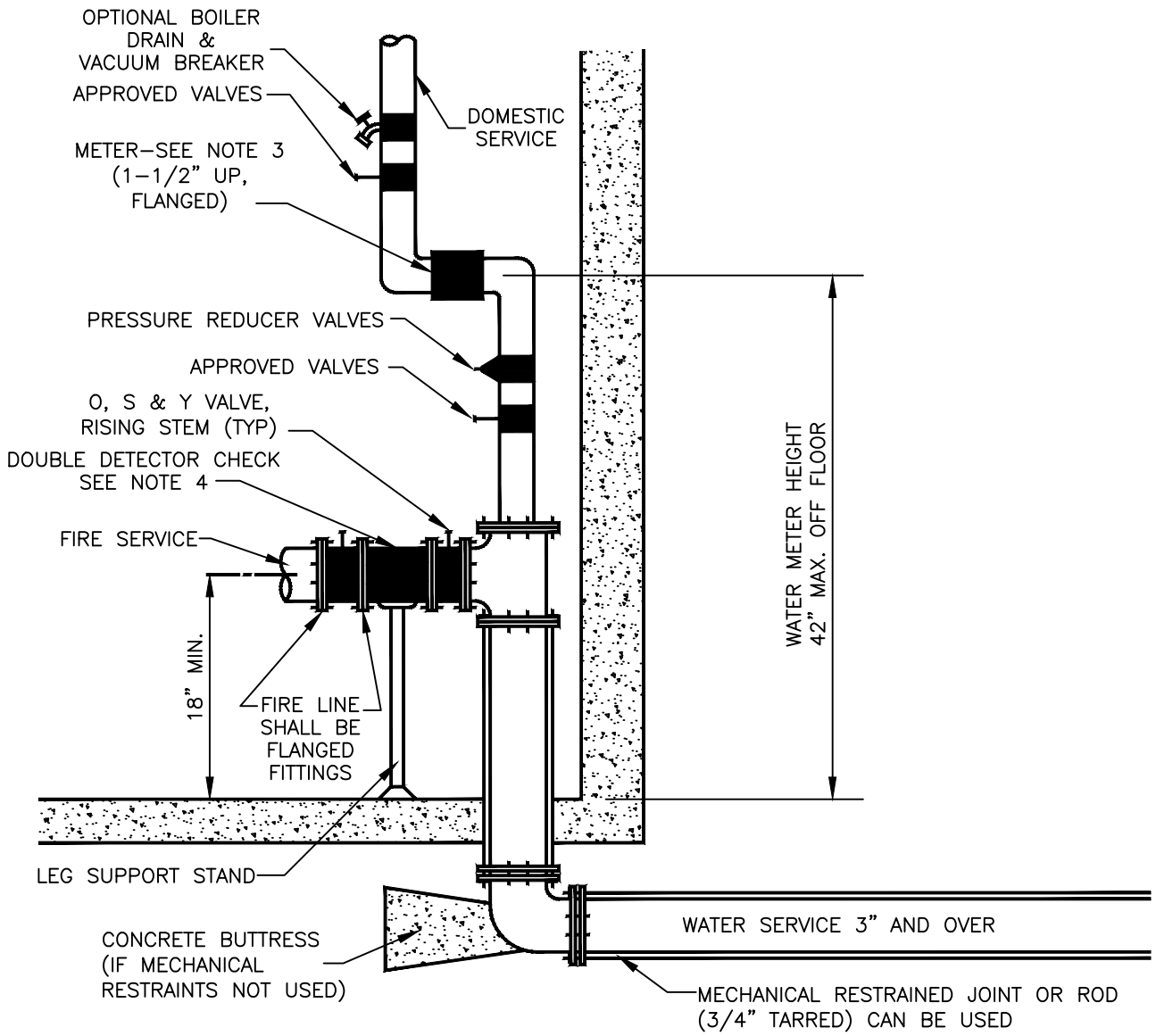
DEWATERING DEVICE

APPROVED: Zachary J. Kershner

DIRECTOR-DEPARTMENT PUBLIC WORKS

W-8.0

MARCH 2017



NOTES:

1. WATER SERVICE SMALLER THAN 3" SHALL BE INSTALLED WITHOUT A DETECTOR CHECK. USE DWELLING DETAIL FOR 3/4" – 2' SERVICES.
2. ALL MATERIALS AND INSTALLATION SHALL BE APPROVED AS PER CURRENT PLUMBING CODE.
3. WATER METER TO BE PURCHASED FROM CITY OF FREDERICK.
4. DOUBLE DETECTOR CHECK SHALL BE PIPED FOR ANTI–THEFT, METER TO BE PURCHASED FROM COF, DETECTOR CHECK CLEARANCES PER CURRENT PLUMBING CODE

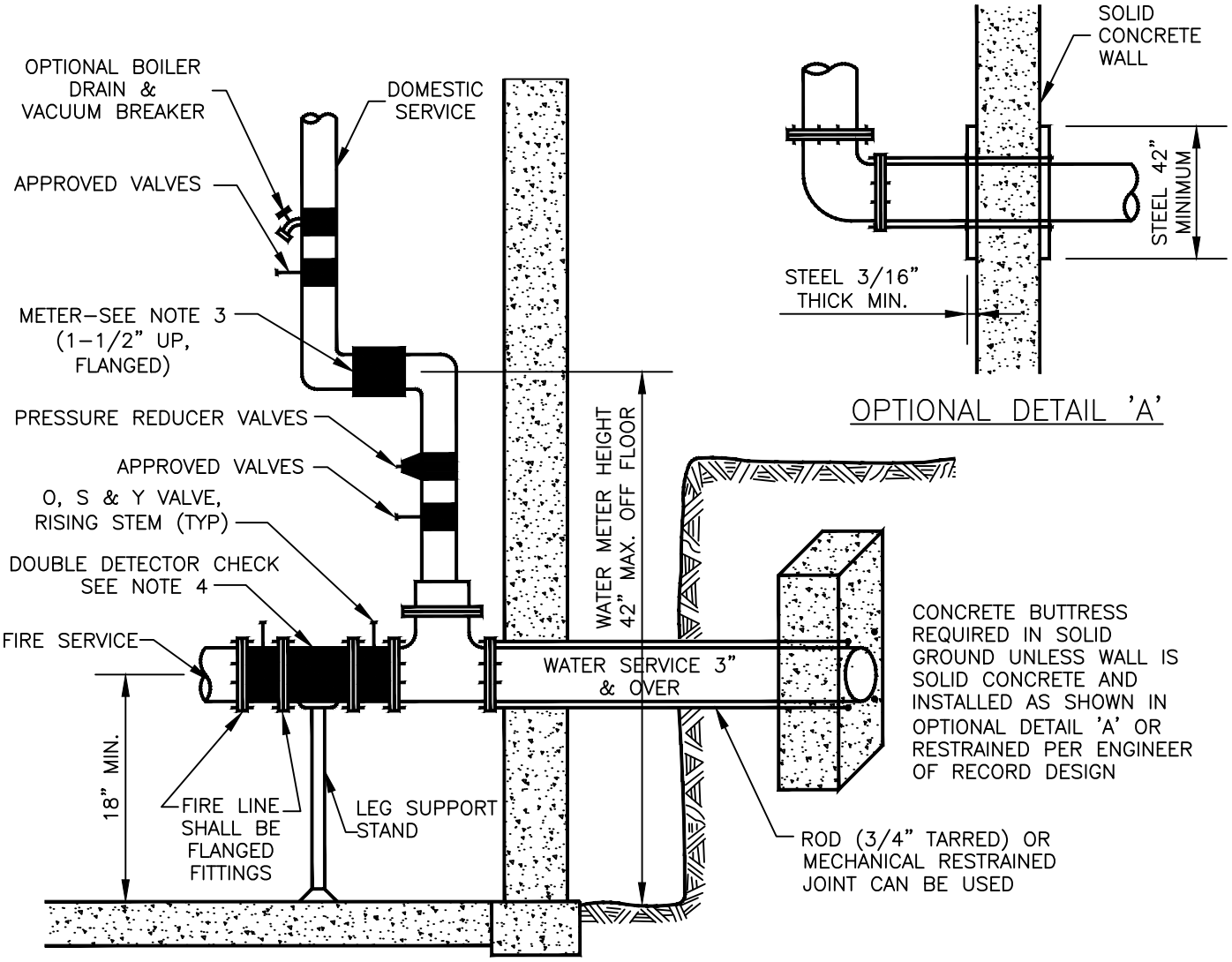
The City of Frederick Maryland

NON-RESIDENTIAL METER SETTING SERVICE THROUGH FLOOR

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

W-9.0

MARCH 2017



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3. WATER METER TO BE PURCHASED FROM CITY OF FREDERICK.
4. DOUBLE DETECTOR CHECK SHALL BE PIPED FOR ANTI–THEFT, METER TO BE PURCHASED FROM COF, DETECTOR CHECK CLEARANCES PER CURRENT PLUMBING CODE

The City of Frederick Maryland

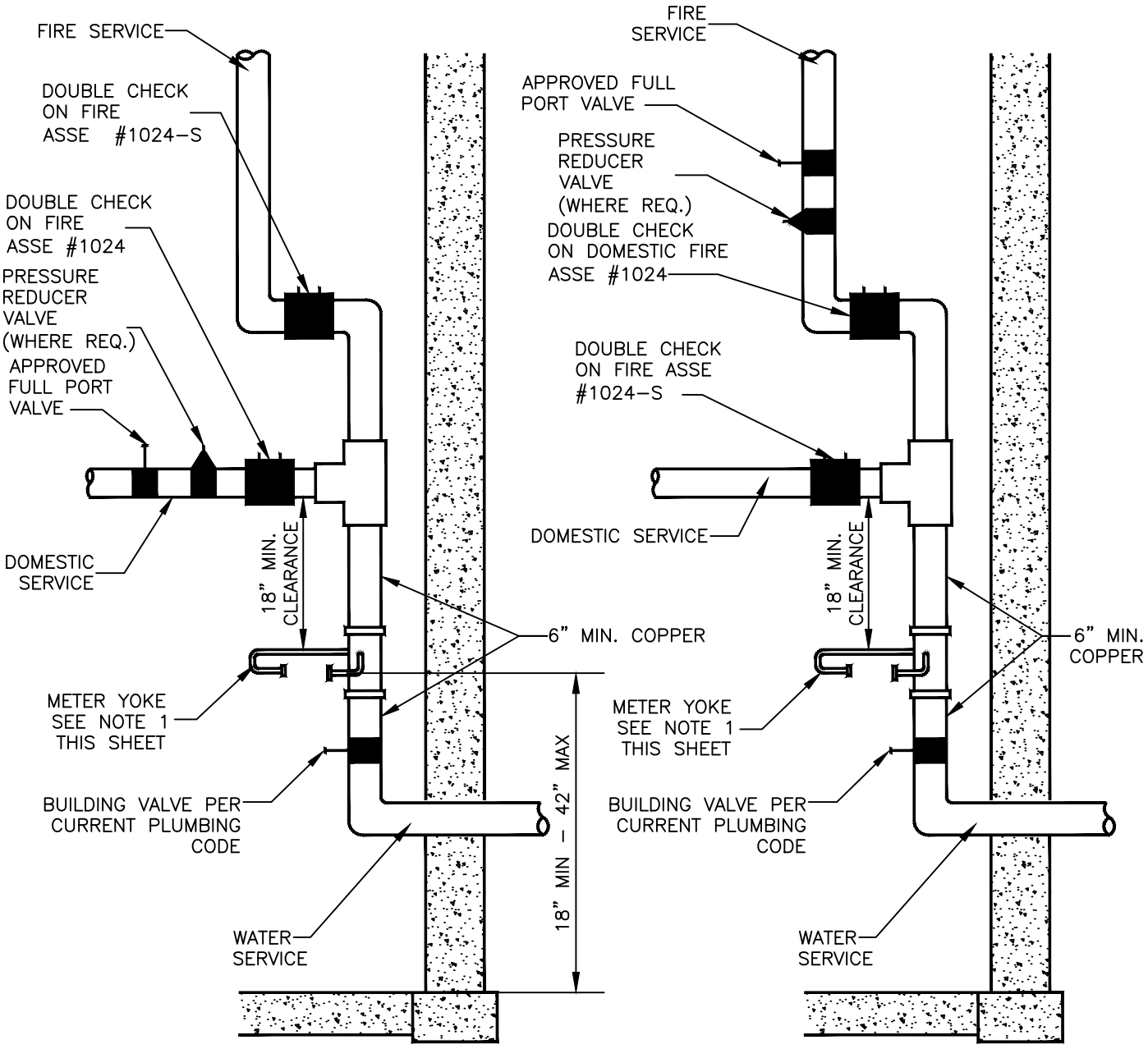
NON-RESIDENTIAL METER SETTING SERVICE THROUGH WALL

APPROVED: Zachary J. Kershner

DIRECTOR–DEPARTMENT PUBLIC WORKS

W-9.1

MARCH 2017



OPTION 1 OPTION 2

BASEMENT OR UTILITY ROOM

NOTES:

1. METERS ARE TO BE PURCHASED FROM THE CITY OF FREDERICK. THE CITY FURNISHES YOKES AND 1" METER. 1-1/2" AND 2" LINES WILL HAVE A FLANGE TYPE METER WHICH THE CITY WILL FURNISH.

2. METER SYSTEM INSTALLED UNDER STAIRS OR LANDINGS PER APPROVAL OF PLUMBING INSPECTOR.

The City of Frederick Maryland

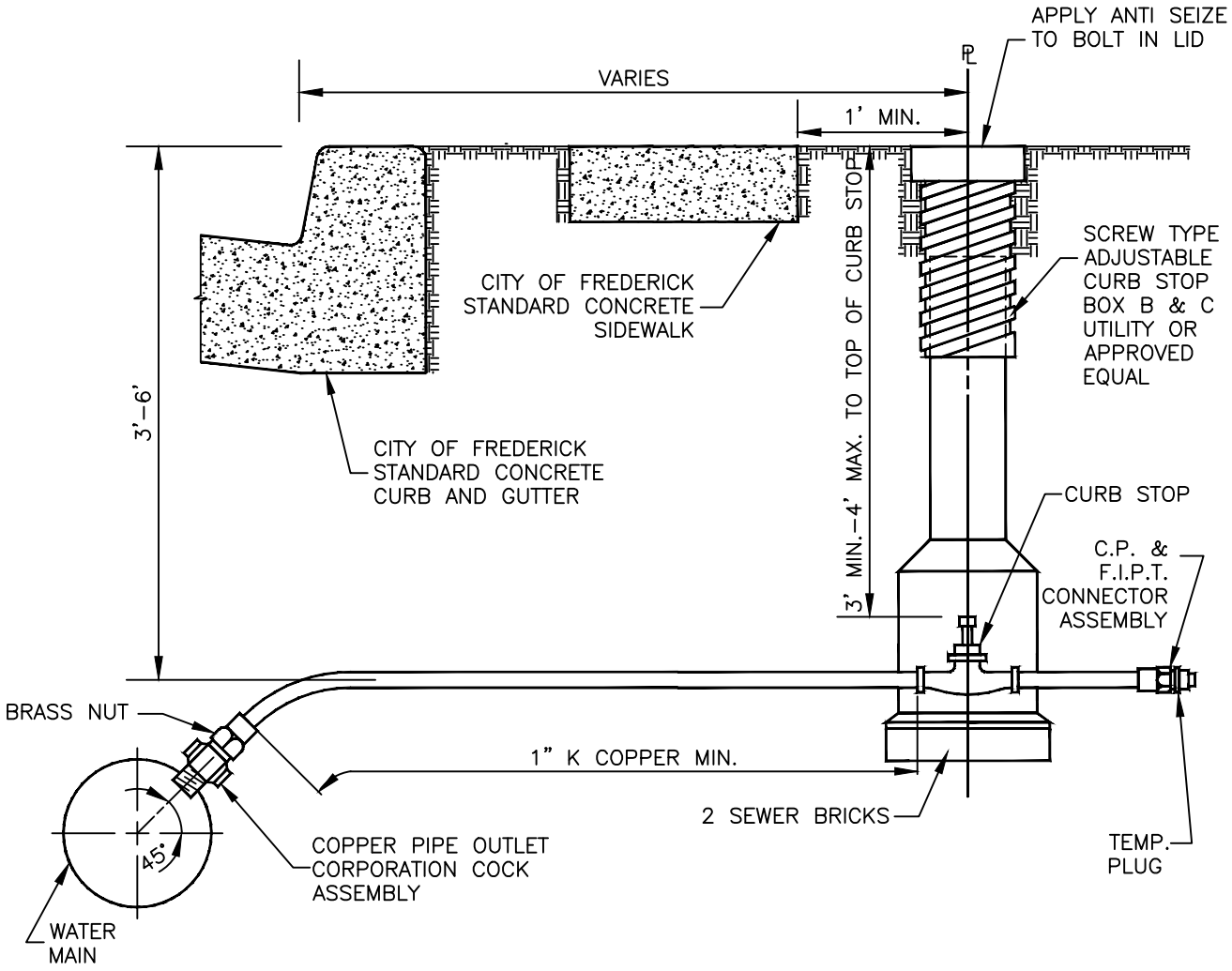
RESIDENTIAL METER SETTING SERVICE AND FIRE LINE SPRINKLERS

W-9.2

APPROVED: Zachary J. Kershner

DIRECTOR-DEPARTMENT PUBLIC WORKS

MARCH 2017



NOTES:

1. WATER METER TO BE INSTALLED INSIDE DWELLING.
2. FOR TAP SIZES AND PIPE CLASS, SEE DETAIL W–10.3
3. WATER HOUSE CONNECTION TAP SIZE IS 1" MIN. FOR SINGLE FAMILY DWELLINGS OR FOR TOWNHOUSES AND/OR AS DETERMINED BY A FIRE PROTECTION ENGINEER. CALCULATIONS TO BE APPROVED BY THE CITY.
4. WHERE TRAFFIC IS EXPECTED, INSTALL ROADWAY VALVE BOX. CONTACT DEPARTMENT OF PUBLIC WORKS, WATER AND SEWER DEPARTMENT FOR APPROPRIATE ROADWAY VALVE BOX TO BE INSTALLED.
5. IF THE SERVICE IS 1.5" AND 2", THEN STAINLESS STEEL EPOXY COATED TAPPING SADDLE IS REQUIRED.

The City of Frederick Maryland

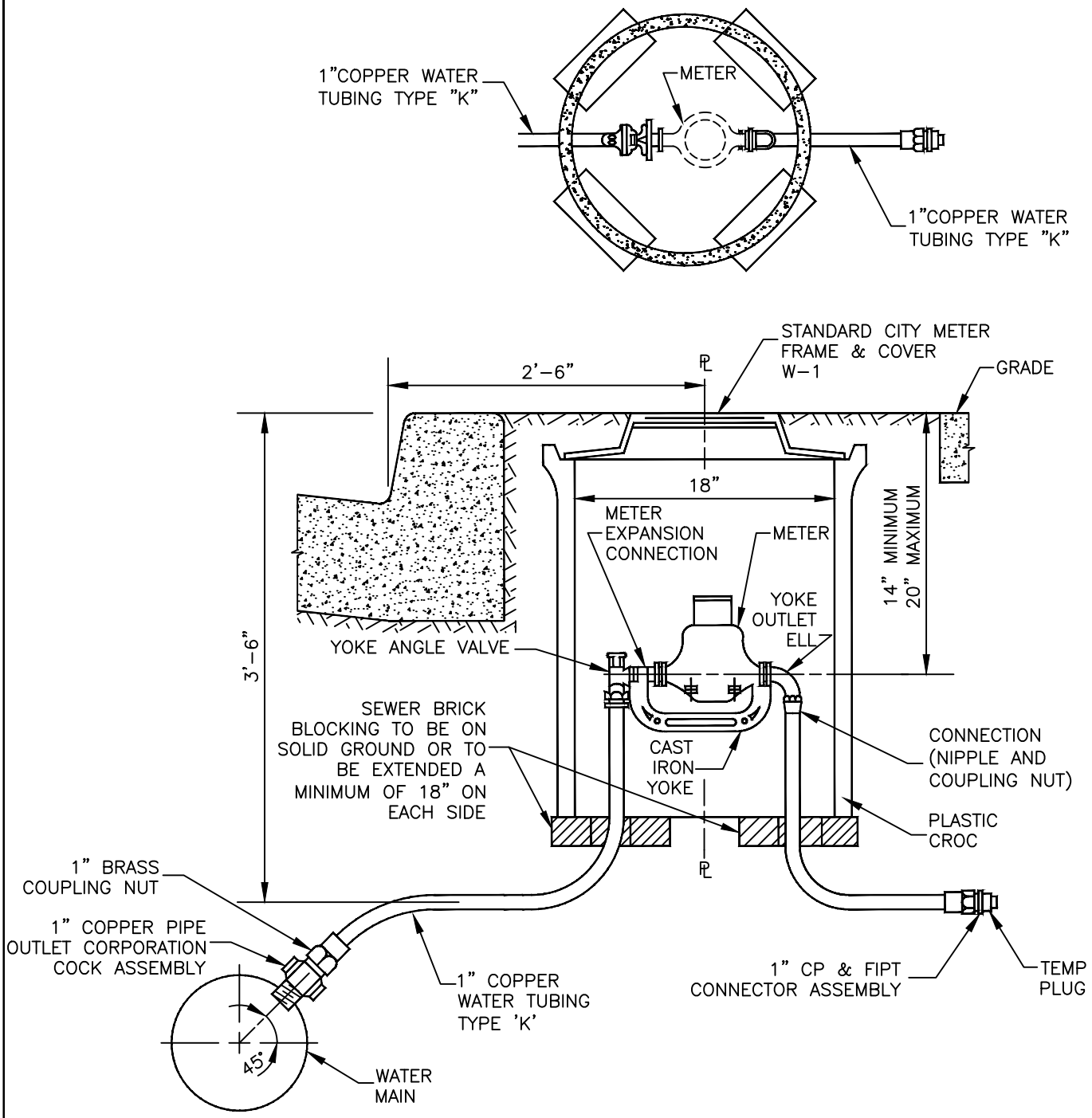
WATER HOUSE CONNECTION FOR INSIDE DWELLING METER

W-10.0

APPROVED: Zachary J. Kershner

DIRECTOR–DEPARTMENT PUBLIC WORKS

MARCH 2017



NOTES:

1. COPPER TUBING TO BE LAID LEVEL WITH TOP OF WATER MAIN UNLESS OTHERWISE DIRECTED BY ENGINEER WHEN WATER AND SEWER CONNECTIONS ARE IN THE SAME TRENCH. COPPER PIPE IS TO BE PEGGED TO SIDE OF TRENCH.

2. FOR TAP SIZES AND PIPE CLASS, SEE DETAIL W-10.3

The City of Frederick Maryland

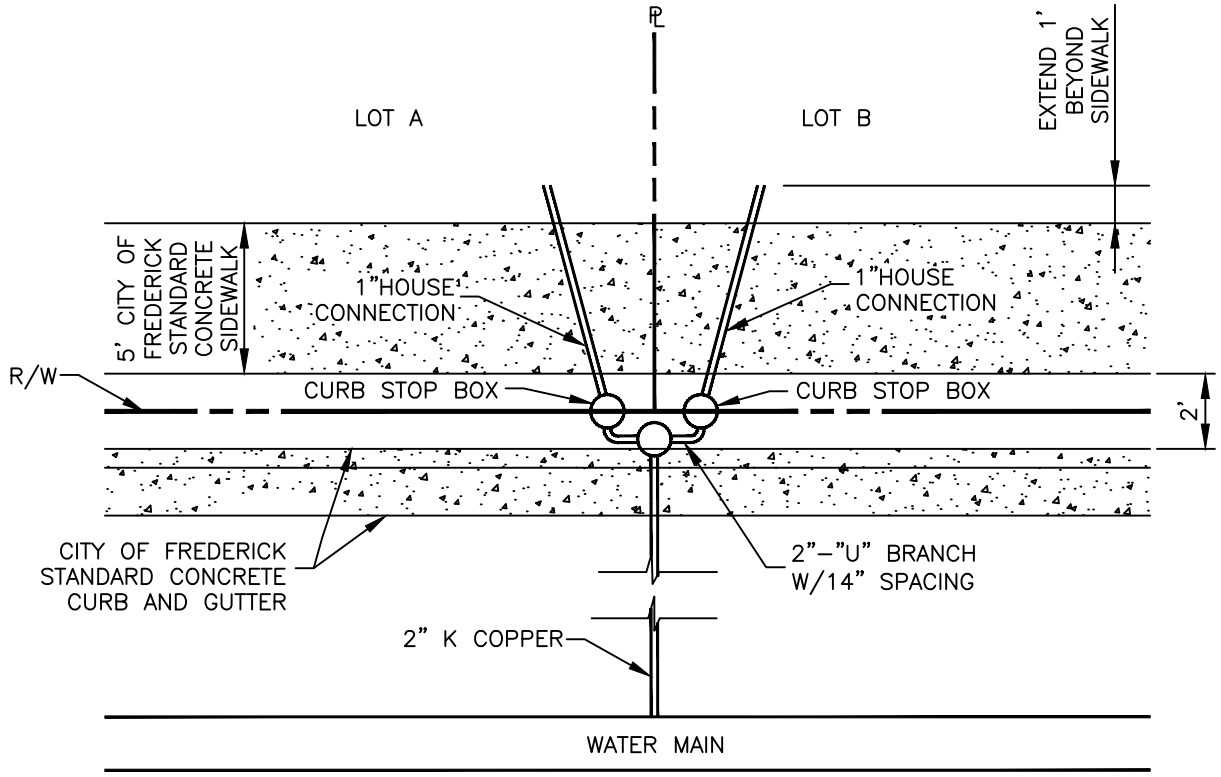
STANDARD INSTALLATION 1" METERED DOMESTIC SERVICE (DOWNTOWN ONLY)

APPROVED: Zachary J. Kershner

DIRECTOR-DEPARTMENT PUBLIC WORKS

W-10.1

MARCH 2017



NOTES:

1. STAINLESS STEEL EPOXY COATED TAPPING SADDLE IS REQUIRED.

The City of Frederick Maryland

DOUBLE WATER HOUSE CONNECTION (TOWNHOUSE ONLY)

APPROVED: Zachary J. Kershner

DIRECTOR–DEPARTMENT PUBLIC WORKS

W-10.2

MARCH 2017

THICKNESS CLASSES				
PIPE SIZE	TAP SIZE			
	1"	1–1/4"	1–1/2"	2"
4"	55	–	–	–
6"	53	55	–	–
8"	52	53	55	–
10"	51	52	53	55
12"	50	51	52	53
14"	50	50	51	52
16"	50	50	50	51

DIP THICKNESS CLASS THAT WILL PROVIDE THE REQUIRED THREE FULL THREADS OF ENGAGEMENT WITH THE CORPORATION STOP INLET THREAD

NOTES:

1. IN CASES WHERE THICKNESS CLASS CAN NOT BE MET OR THICKNESS IS NOT KNOWN A DOUBLE BAND SADDLES, OR APPROVED EQUAL, AND CORPORATION STOPS SHALL BE USED.

2. THREAD DOPE SHALL BE USED WITH ALL CORPORATION STOPS.

The City of Frederick Maryland

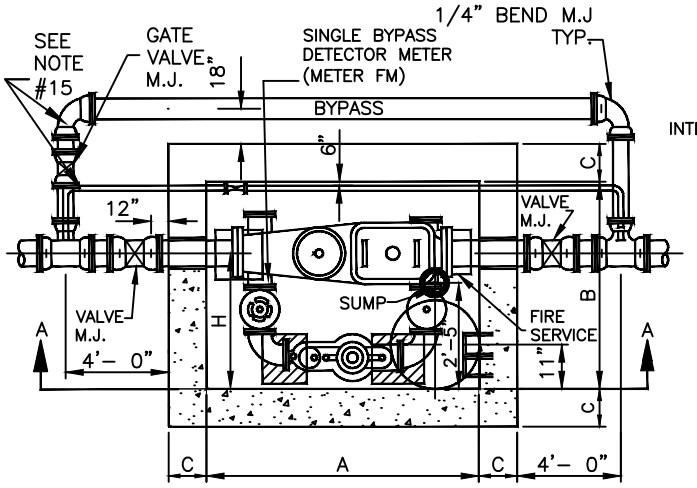
TAP SIZES AND PIPE CLASS FOR WATER HOUSE CONNECTIONS

W-10.3

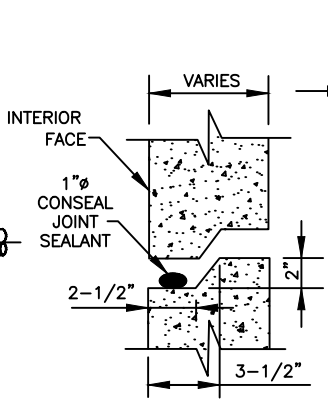
APPROVED: _____

DIRECTOR–DEPARTMENT PUBLIC WORKS

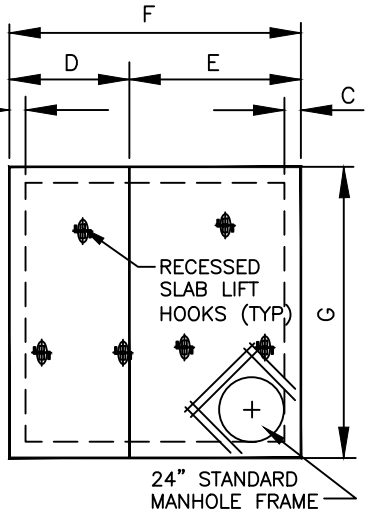
MARCH 2017

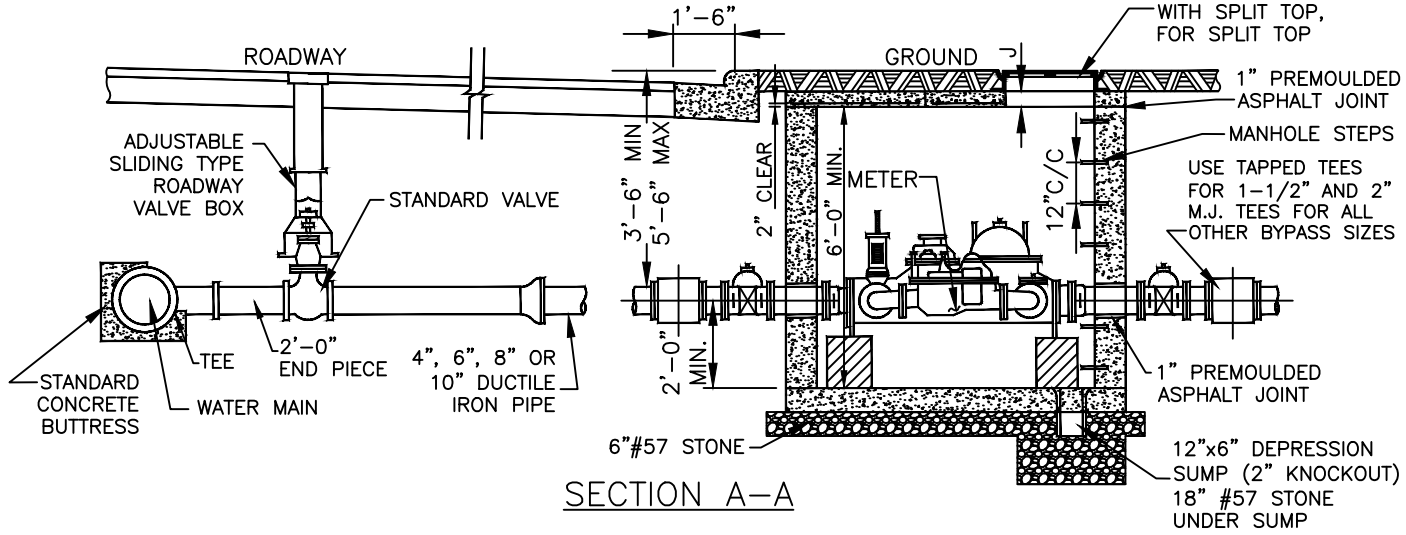


PLAN



WALL SHIPLAP JOINT DETAIL





SECTION A-A

NOTES:

1. 1", 1-1/2" AND 2" BYPASS LINES TO BE COPPER TYPE "K".
2. ALL DUCTILE IRON PIPE TO BE CLASS 50 OR BETTER.
3. BOTTOM OF VAULT SHALL BE CONCRETE, ALL VAULT CONCRETE TO BE MSHA NO.3.
4. BLOCK 3", 4" AND 6" TEES AND BENDS WITH RESTRAINT JOINTS.
5. 1", 1-1/2", AND 2" BYPASS LINES TO BE PLACED INSIDE VAULT, ALL OTHERS OUTSIDE VAULT.
6. BRICK PIERS TO BE 8"X 4" UNDER 2"& 3" METERS, 8"X 8" UNDER 4"& 6" METER AND 12"X 12" UNDER 8"& 10" METERS.
7. PLACE 1/2" PREMOLDED BITUMINOUS JOINT MATERIAL BETWEEN CONCRETE AND METER FRAME.
8. VALVE BOXES TO BE PLACED ON ALL EXTERIOR VALVES.
9. FOR THE 2" METER USE COPPER TUBING, 2" x 1" COPPER TEES, COPPER TO IRON PIPE THREAD ADAPTORS, BRASS VALVES, BRASS PIPE NIPPLES AND CONNECT TO METER FLANGES WITH A.S.A. CLASS 125 COMPANION FLANGES TOPPED 2" I.P.T.
10. SOLID SLEEVE IS PERMISSIBLE INSIDE VAULT.
11. A 24" MANHOLE IS REQUIRED, ALL OTHER SIZES TO BE APPROVED BY CITY OF FREDERICK DPW & ENGINEERING DEPT.
12. ALL METERS TO BE PURCHASED THROUGH THE CITY OF FREDERICK DPW AT TIME OF SERVICE APPLICATION.
13. ALL CONNECTIONS SHALL BE FULL RESTRAINT.

METER SIZE	BYPASS SIZE	A	B	C	D	E	F	G	H	J
2"	1"	6'-5"	6'-4"	8"	3'-10"	3'-11"	7'-9"	7'-8"	3'-10"	9"
3"	1-1/2"	6'-5"	6'-4"	8"	3'-10"	3'-11"	7'-9"	7'-8"	3'-10"	9"
4"	2"	6'-5"	6'-6"	8"	3'-10"	3'-11"	7'-9"	7'-10"	3'-11"	9"
6"	4"	7'-5"	6'-11"	8"	4'-4"	4'-5"	8'-9"	8'-3"	4'-3"	10"
8"	4"	8'-1"	7'-7"	1'-0"	5'-0"	5'-1"	10'-1"	9'-7"	4'-9"	11"
10"	6"	9'-4"	8'-8"	1'-0"	5'-8"	5'-8"	11'-4"	10'-8"	5'-6"	11"
10"X 12"	6"	9'-4"	8'-8"	1'-0"	5'-8"	5'-8"	11'-4"	10'-8"	5'-6"	11"

The City of Frederick Maryland

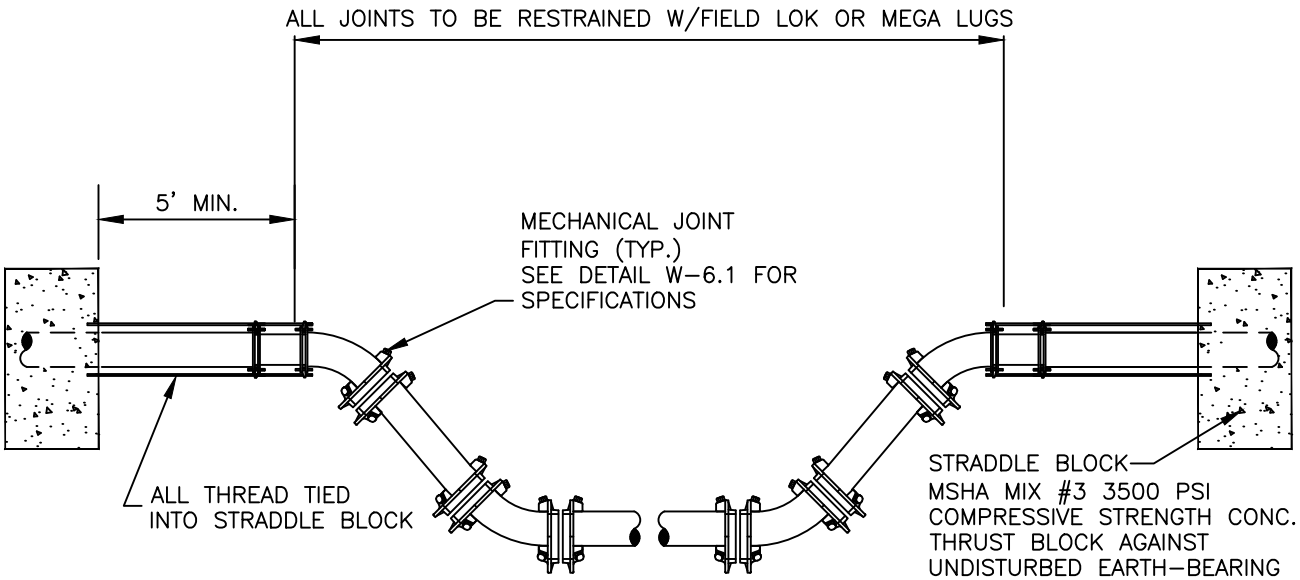
STANDARD WATER METER VAULT NON-RESIDENTIAL

APPROVED: Zachary J. Kearbey

DIRECTOR-DEPARTMENT PUBLIC WORKS

W-11.0

MARCH 2017



VERTICAL BEND RESTRAINT

CONCRETE THRUST BLOCK SCHEDULE

(BEARING AREA OF THRUST BLOCKS IN SQUARE FEET)

FITTING SIZE (INCHES)	90° BEND, TEE, OR PLUGGED CROSS	45° BEND	22 1/2° BEND	11 1/4° BEND
4	1.9	1.3	--	--
6	4.0	2.1	1.3	--
8	7.1	3.9	2.0	1.3
12	16.0	8.8	4.5	2.3
16	28.4	15.5	8.0	4.0
24	64.0	34.9	18.1	9.1

ABOVE BEARING AREA BASED ON TEST PRESSURE OF 150 P.S.I. AND AN ALLOWABLE SOIL BEARING CAPACITY OF 1500 POUND PER SQUARE FOOT. TO COMPUTE CAPACITY AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING CAPACITY, USE THE FOLLOWING EQUATION. BEARING AREA = (TEST PRESSURE/150) x (1500/SOIL BEARING CAPACITY) X TABLE VALUE.

NOTES:

1. BEARING AREA IN SQUARE FEET TO BE DETERMINED BY CHART OR BY CITY ENGINEER, DEPENDING ON SOIL CONDITIONS.
2. SEE DETAIL W-6.0 FOR NUMBER OF RODS BASED ON PIPE SIZE

The City of Frederick Maryland

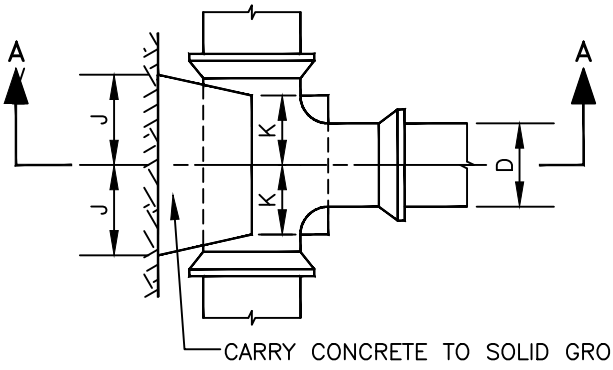
TYPICAL WATER MAIN VERTICAL OFFSET TYING

W-12.0

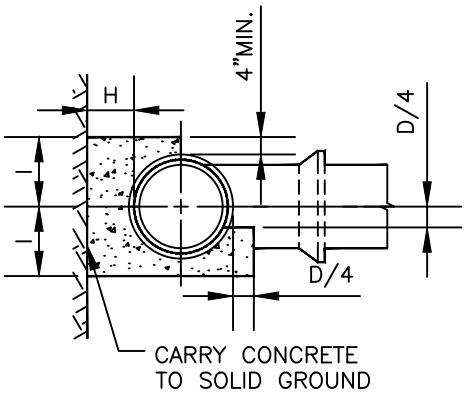
APPROVED: _____

DIRECTOR-DEPARTMENT PUBLIC WORKS

MARCH 2017



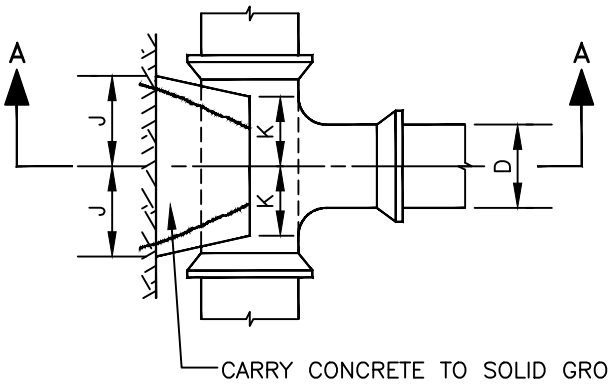
PLAN



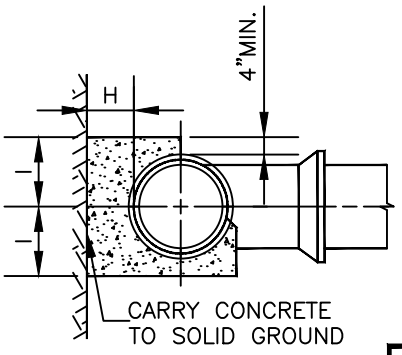
SECTION A–A

SIZE OF BRANCH									
D	6"	8"	10"	12"	16"	20"	24"	30"	36"
H	8"	9"	10"	1'–0"	1'–2"	1'–4"	1'–6"	1'–9"	2'–0"
I	8"	10"	1'–0"	1'–3"	1'–8"	2'–1"	2'–6"	3'–1"	3'–9"
J	7"	9"	1'–3"	1'–2"	1'–6"	1'–11"	2'–4"	2'–10"	3'–5"
K	6"	8"	8"	8"	10"	1'–2"	1'–4"	1'–6"	1'–10"

BUTTRESS FOR TEES



PLAN



SECTION A–A

SIZE OF BRANCH				
D	6"	8"	10"	12"
H	8"	9"	10"	12"
I	8"	10"	12"	15"
J	7"	9"	12"	14"
K	3"	4.5"	5.5"	7"

BUTTRESS FOR COMPACT TEES

NOTES:

1. ALL CONCRETE TO BE MSHA MIX NO. 1 MIN.
2. BUTTRESS DIMENSIONS SHOWN ARE MINIMUM DIMENSIONS, ARE BASED UPON SOIL BEARING CAPACITY OF 3000 PSF AND STATIC WATER PRESSURE OF 150 PSI. WHERE PRESSURE EXCEEDS 150 PSI OR WHERE SOIL BEARING CAPACITY IS LESS THAN 3000 PSF SPECIAL BUTTRESS DESIGN IS REQUIRED.

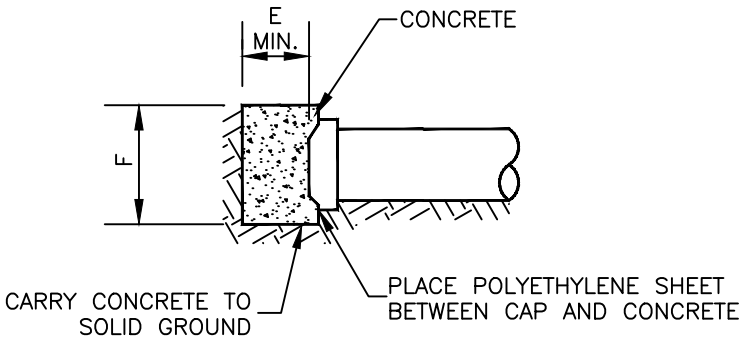
The City of Frederick Maryland

BUTTRESS FOR TEES
& BUTTRESS FOR COMPACT TEES

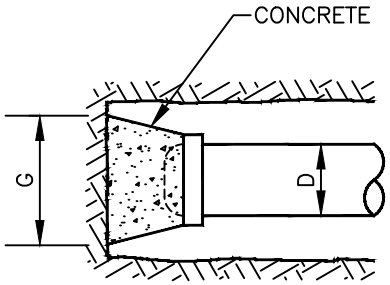
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

W-13.0

MARCH 2017



SECTION



PLAN

BUTTRESS FOR CAPS										
D	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"
E	7"	6"	8"	8"	10"	1'–0"	1'–4"	1'–8"	2'–0"	2'–0"
F	14"	1'–0"	1'–4"	1'–8"	2'–0"	2'–8"	3'–3"	4'–0"	4'–9"	5'–9"
G	12"	1'–5"	1'–11"	2'–5"	2'–10"	3'–9"	4'–9"	5'–8"	7'–6"	8'–10"

NOTES:

1. ALL CONCRETE TO BE MSHA MIX NO. 1 MIN.
2. BUTTRESS DIMENSIONS SHOWN ARE MINIMUM DIMENSIONS ARE BASED UPON SOIL BEARING CAPACITY OF 3000 P.S.F. AND STATIC WATER PRESSURE OF 150 P.S.I. WHERE PRESSURE EXCEEDS 150 P.S.I. OR WHERE SOIL BEARING CAPACITY IS LESS THAN 3000 P.S.F. SPECIAL BUTTRESS DESIGN IS REQUIRED.

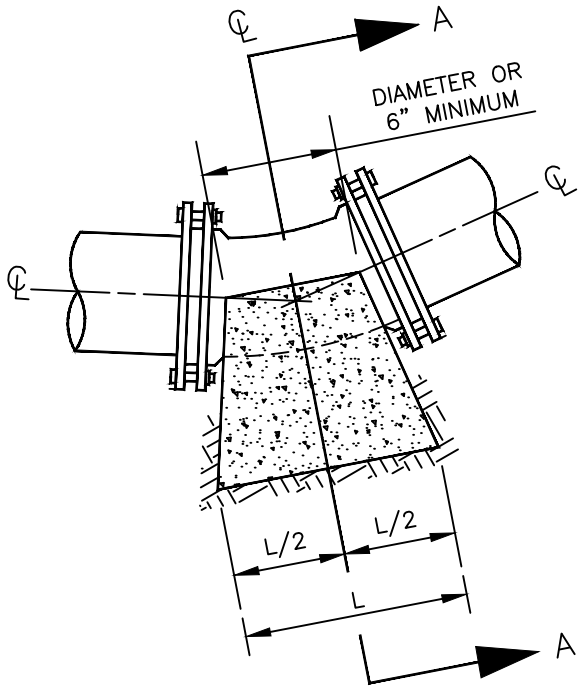
The City of Frederick Maryland

BUTTRESS FOR CAPS

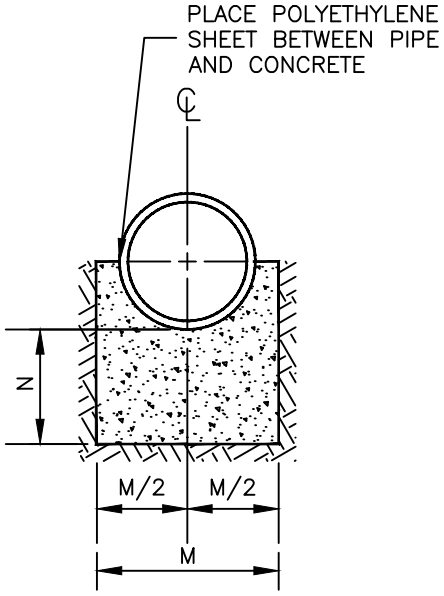
W-14.0

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

MARCH 2017



ELEVATION



SECTION A–A

BEND		SIZE								
		4"	6"	8"	10"	12"	16"	20"	24"	30"
11–1/4°	L	0'–6"	0'–6"	0'–8"	0'–8"	0'–8"	1'–1"	1'–5"	1'–10"	2'–8"
	M	1'–0"	1'–2"	1'–4"	1'–6"	2'–0"	2'–4"	2'–8"	3'–0"	3'–4"
1/32	N	0'–8"	0'–8"	0'–8"	0'–8"	0'–8"	0'–9"	0'–10"	1'–0"	1'–0"
22–1/2°	L	0'–8"	0'–10"	0'–11"	1'–3"	1'–4"	2'–1"	2'–9"	3'–7"	5'–3"
	M	1'–0"	1'–2"	1'–4"	1'–6"	2'–0"	2'–4"	2'–8"	3'–0"	3'–2"
1/16	N	0'–8"	0'–8"	0'–8"	0'–9"	0'–9"	1'–0"	1'–2"	1'–4"	1'–6"
45°	L	1'–0"	1'–2"	1'–9"	2'–5"	2'–8"	4'–0"	5'–6"	6'–0"	8'–2"
	M	1'–0"	1'–2"	1'–4"	1'–6"	2'–0"	2'–4"	2'–8"	3'–6"	4'–0"
1/8	N	0'–8"	0'–8"	0'–8"	1'–0"	1'–2"	1'–6"	2'–0"	2'–6"	3'–0"
90°	L	1'–4"	2'–0"	2'–8"	3'–4"	3'–8"	5'–6"	6'–8"	8'–0"	9'–8"
1'–0"	M	0'–10"	1'–0"	1'–4"	1'–9"	2'–3"	2'–8"	3'–6"	4'–0"	4'–7"
1/4	N	1'–8"	1'–8"	1'–8"	1'–8"	1'–8"	2'–0"	2'–3"	2'–9"	3'–5"

NOTES:

1. ALL CONCRETE TO BE MSHA MIX NO. 1 MIN.
2. ALL BEARING SURFACES SHALL BE PLACED AGAINST UNDISTURBED GROUND WITH A MINIMUM SOIL BEARING PRESSURE OF 3000 LBS. PER SQUARE FOOT.
3. THESE BUTTRESSES SHALL BE USED FOR HORIZONTAL AND VERTICAL BENDS.

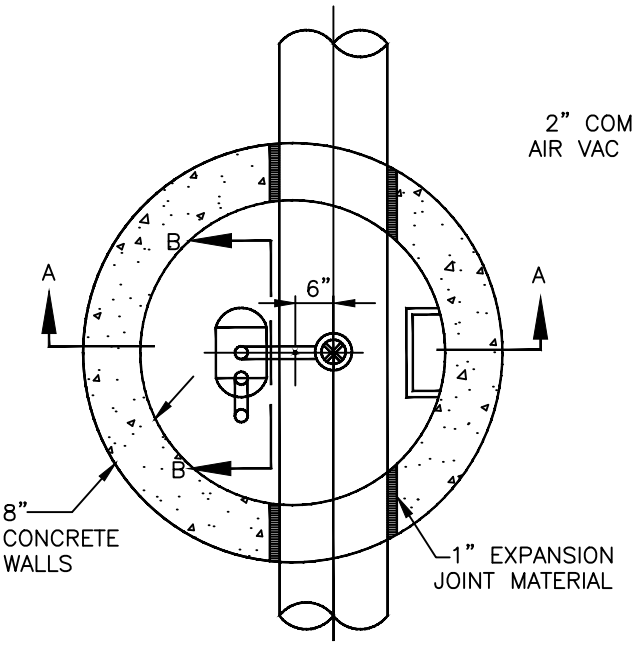
The City of Frederick Maryland

BUTTRESSES FOR USE AT HORIZONTAL AND VERTICAL BENDS

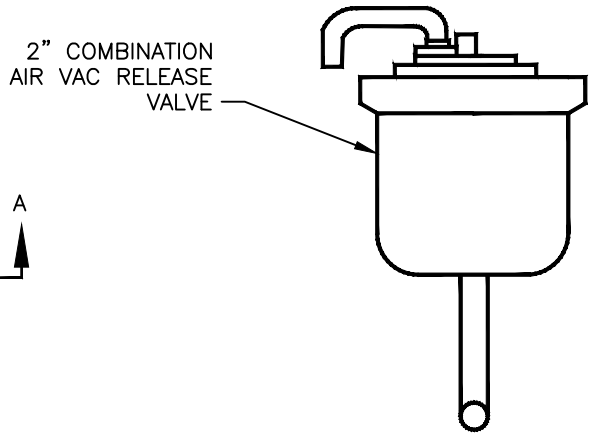
APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

W-15.0

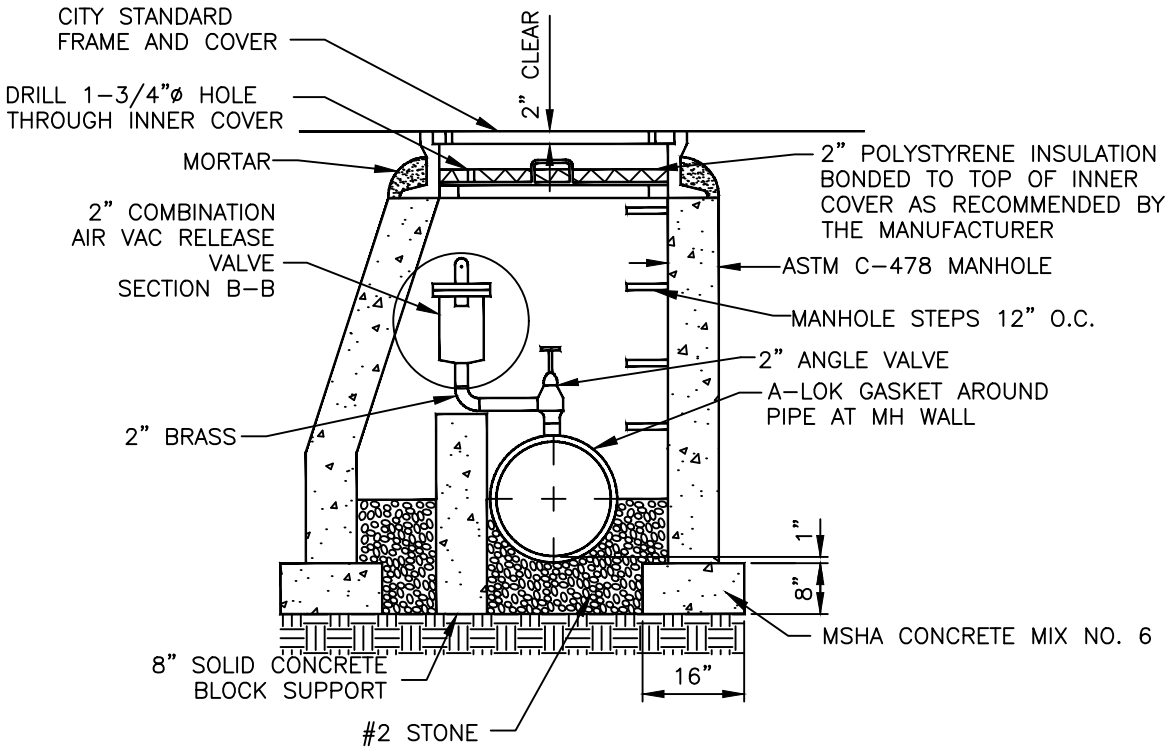
MARCH 2017



PLAN



SECTION B–B
AIR VAC RELEASE VALVE



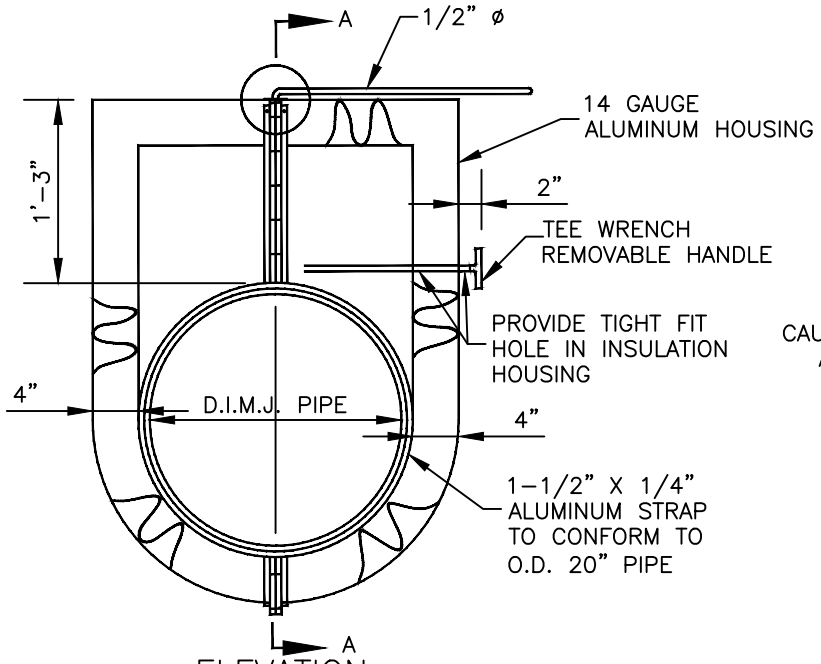
SECTION A–A

NOTES:

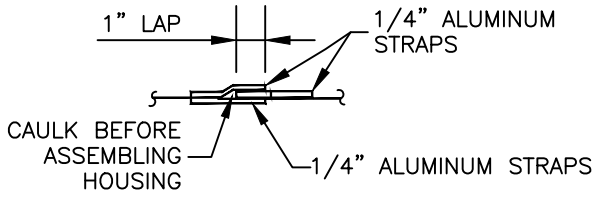
MORTAR TO BE TYPE II CEMENT MIXED PER CITY OF FREDERICK SPEC. (1PART CEMENT AND 2 ½ PARTS SAND, CONFORMING TO ASTM C144).

The City of Frederick Maryland	AIR/VAC RELEASE VALVE MANHOLE	W-16.0
	APPROVED: Zachary J. Kershner DIRECTOR–DEPARTMENT PUBLIC WORKS	

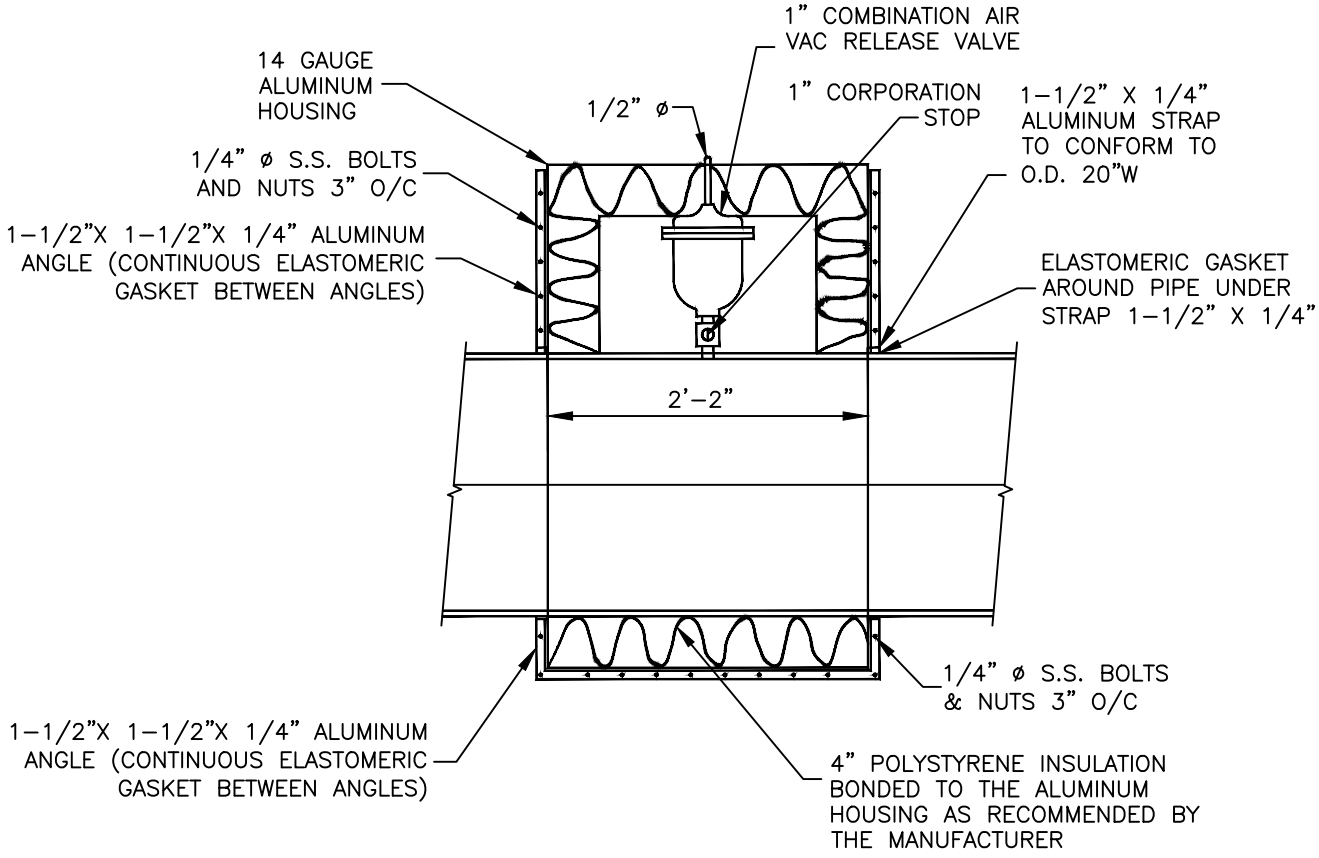
MARCH 2017



ELEVATION



TOP SEAM



SECTION A-A

NOTES:

1. ALUMINUM ANGLES AND STRAPS TO BE WELDED TO ALUMINUM HOUSING

The City of Frederick Maryland

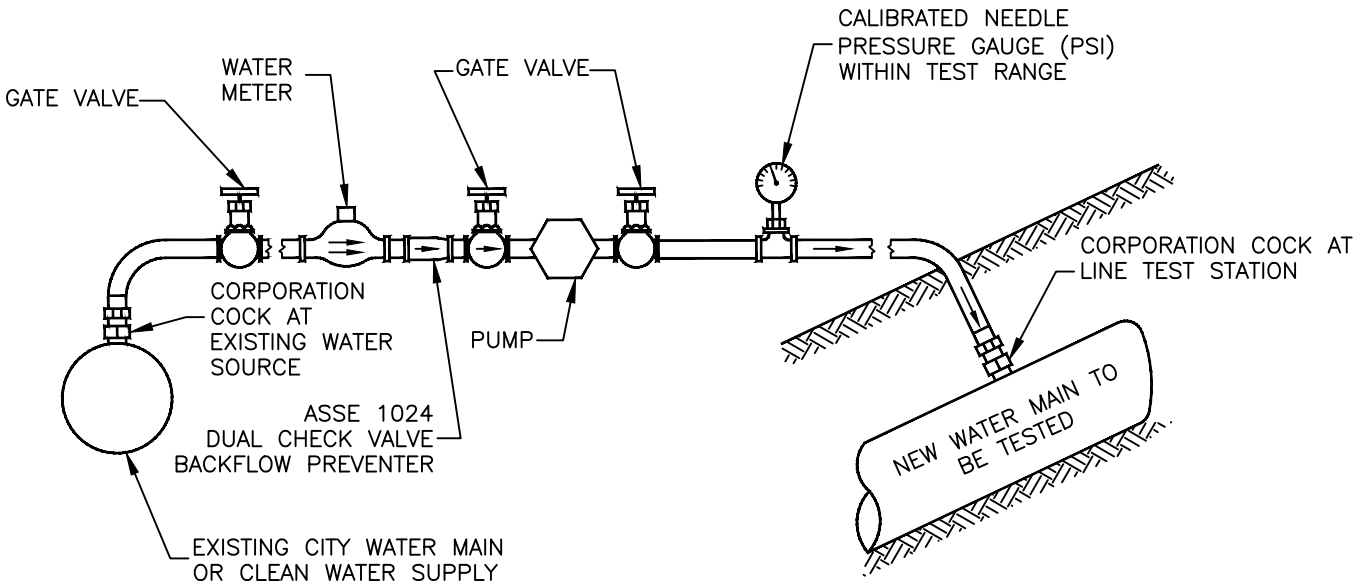
SPECIAL AIR RELEASE VALVE

W-17.0

APPROVED: Zachary J. Kershner

DIRECTOR-DEPARTMENT PUBLIC WORKS

MARCH 2017



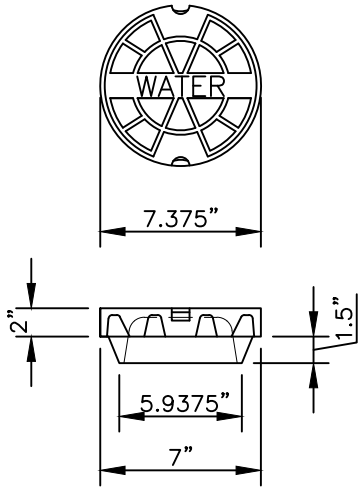
NOTES:

1. WATER METER AND PRESSURE GAUGE TO BE FURNISHED BY CITY OF FREDERICK.
2. ALL LINES, FITTINGS, AND TEST APPURTENANCES SHALL BE CAPABLE OF WITHSTANDING MAXIMUM TEXT PRESSURE.
3. PROVIDE ADEQUATE PROTECTION TO ALL LINES, FITTINGS AND TEST APPURTENANCES WHEN TESTING DURING FREEZING WEATHER.
4. PUMP MUST BE CAPABLE OF PRESSURE WITHIN TEST RANGE (PROVIDE FOR PRESSURE RELIEF ON PUMP).
5. PROVIDE CORPORATION COCK WITH COPPER CONNECTION AT LOCATIONS AS DIRECTED FOR CHLORINE AND BACTERIA TESTS.

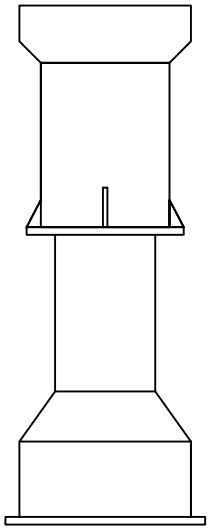
The City of Frederick Maryland	METHOD OF TESTING WATER MAINS	W-18.0
	APPROVED: Zachary J. Kershner DIRECTOR–DEPARTMENT PUBLIC WORKS	

MARCH 2017

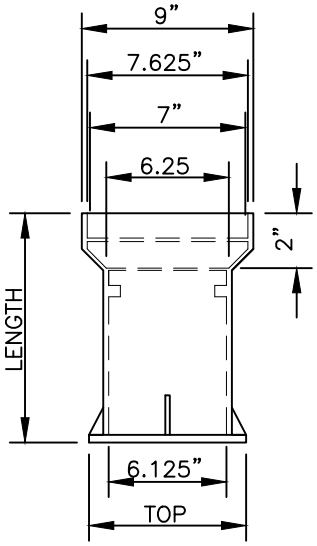
HEIGHT	LENGTH	
	TOP	BOTTOM
29"–38"	16"	24"
41"–51"	16"	36"
41"–61"	26"	36"
53"–73"	26"	48"



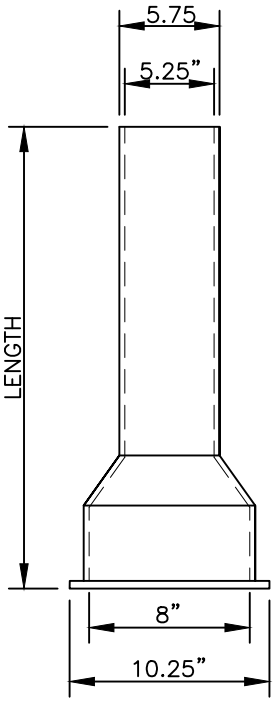
COVER DETAILS



BOX COMPLETE



TOP



BOTTOM

NOTES:

1. VALVE BOX TO BE STAR PIPE PRODUCTS 2–PIECE HEAVY DUTY SLIP TYPE VALVE BOX, PRODUCT #VB–0004 OR APPROVED EQUAL

2. FOR LINES DEEPER THAN 73" SEE DETAILS 20.0–20.2, DEEP VALVE BOXES AND EXTENSION STEM

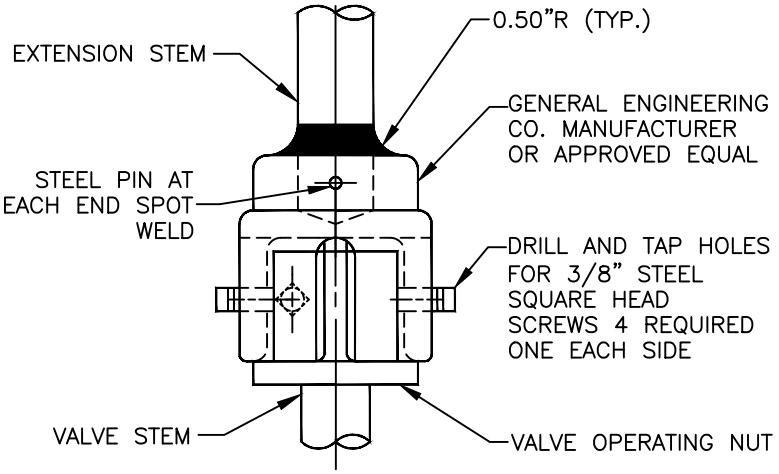
The City of Frederick Maryland

WATER VALVE BOX

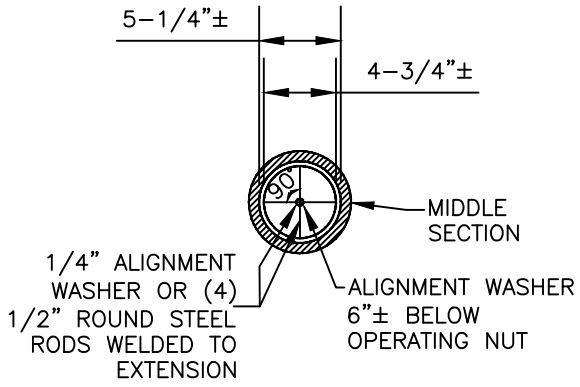
APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

W-19.0

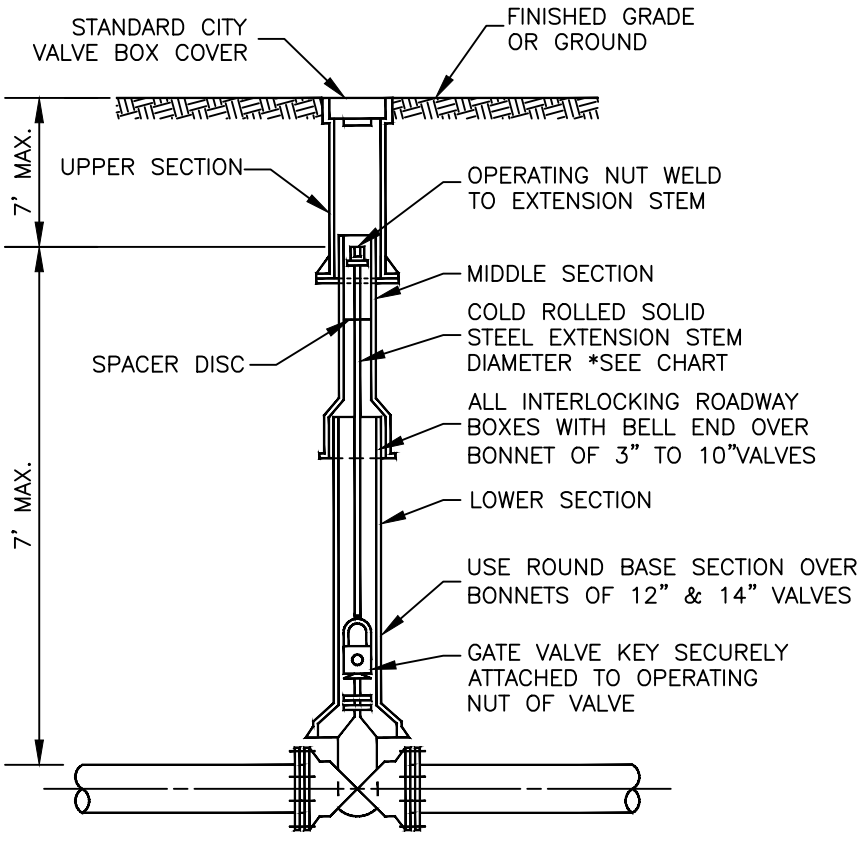
MARCH 2017



GATE VALVE KEY



SPACER DISC



GATE VALVE

The City of Frederick Maryland

EXTENSION STEM AND VALVE BOXES FOR DEEP VALVE SETTINGS

APPROVED: Zachary J. Kearbey

DIRECTOR–DEPARTMENT PUBLIC WORKS

W-20.0

MARCH 2017

NOTES:

1. EXTENSION STEM TO BE SECURELY WELDED TO GATE VALVE KEY.
2. LENGTH OF STEM TO BE SUCH THAT OPERATING NUT WILL BE LOCATED AS PRESCRIBED ON DETAIL W–20.0.
3. WELD FOUR (4) –1/2" ROUND STEEL RODS OR 1/4" THICK STEEL ALIGNMENT WASHER TO EXTENSION STEM TO ENSURE OPERATING NUT IS CENTRALLY LOCATED WITHIN VALVE BOX.
4. STANDARD DETAIL W–20.0 IS TO BE USED WHEN DISTANCE FROM TOP OF OPERATING NUT OF VALVE TO FINISHED GRADE OR GROUND EXCEEDS 4'–0".
5. ALL CONSTRUCTION TO BE PLUMB.
6. GENERAL ENGINEERING CO. PART NO. 3339 IS A BASE NUMBER AND SHOULD BE FOLLOWED BY A LETTER WHICH DESIGNATES THE STEM'S OUTSIDE DIAMETER.

PARTS FROM GENERAL ENGINEERING CO.
OR APPROVED EQUAL
BASE NUMBER 3339

LETTER DESIGNATION	STEM OUTSIDE DIAMETER
A	7/8"
B	1"
C	1"–1/8"
D	1"–1/4"
E	1"–3/8"
F	1"–1/2"
G	1"–3/4"
H	2"

DIMENSIONS FOR VALVES
AND EXTENSION STEMS

VALVE SIZE	4"	6"	8"	10"	12"	14"	16"	20"	24"	30"	36"	42"	48"
EXTENSION STEM DIAMETER	1"	1"	1½"	1½"	1½"	1½"	1½"	1½"	1½"	1½"	1½"	1½"	1½"

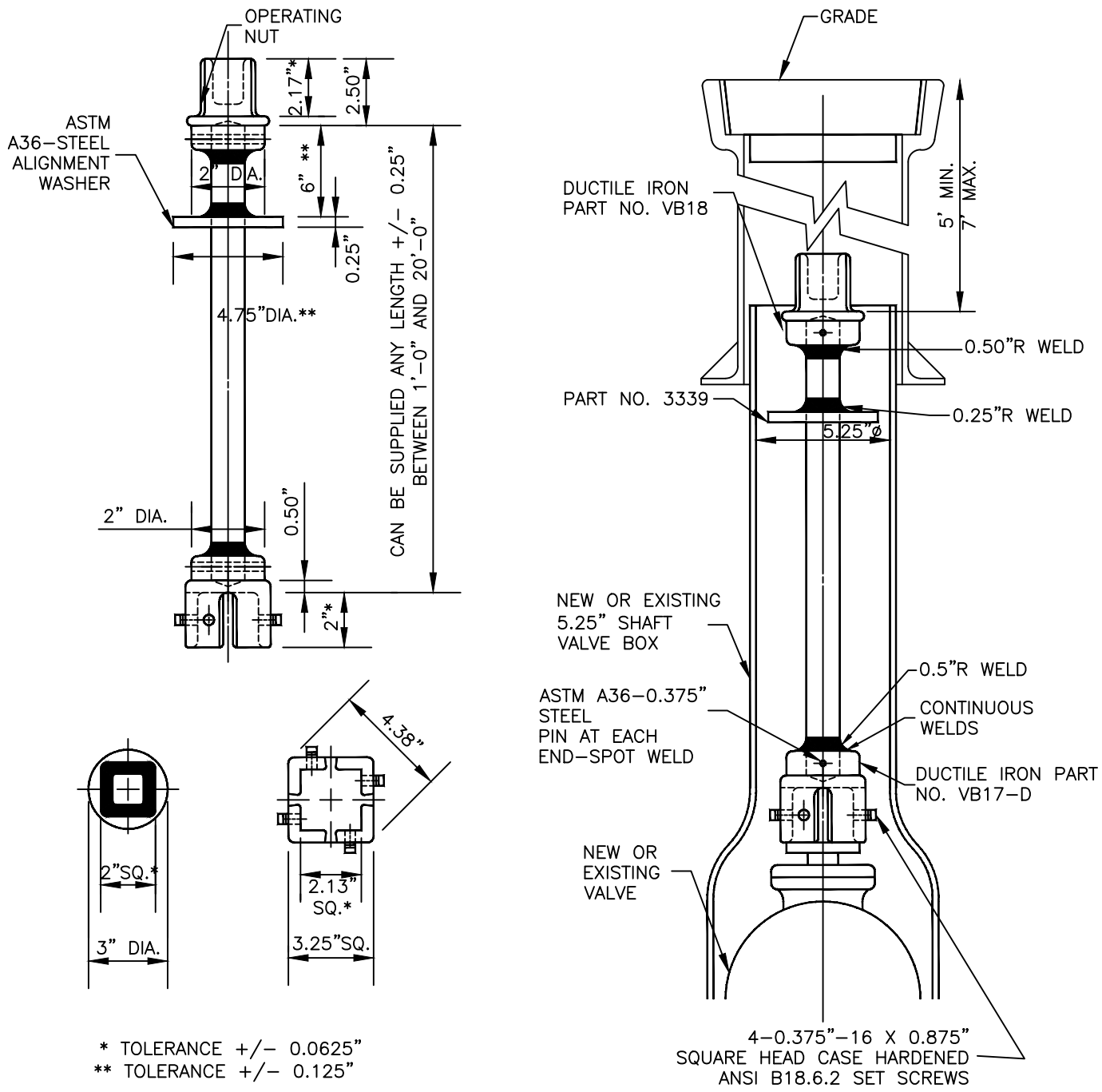
The City of Frederick Maryland

EXTENSION STEM & VALVE BOXES FOR DEEP VALVE SETTINGS TABLES OF VALUES & NOTES

APPROVED: Zachary J. Kershner
DIRECTOR–DEPARTMENT PUBLIC WORKS

W-20.1

MARCH 2017



NOTES:

1. DUCTILE PARTS ARE TYPE 80–60–03. 80 / 100,000 PSI TENSILE–ASTM A536.
2. PART NUMBERS ARE THE GENERAL ENGINEERING CO. OR APPROVED EQUAL.

The City of Frederick Maryland

VALVE EXTENSION STEM FOR CITY VALVE BOXES

APPROVED: _____
DIRECTOR–DEPARTMENT PUBLIC WORKS

W-20.2

MARCH 2017

NOTES:

1. PDF OF EACH WATER VALVE TIE DRAWING SHALL BE SUBMITTED TO THE CITY ON 8–1/2" X 11".

2. DRAFTING OF THE WATER VALVE TIE DRAWINGS MUST CONFORM TO THE SHEET LAYOUT, CITY REQUIRED DRAFTING SYMBOLS FOR VALVE TIES & NORTH ARROW AS DICTATED ON DETAIL SHEETS W–21.0 THROUGH W–21.3.

3. THE PEN AND TEXT SIZES STIPULATED IN THE WATER VALVE TIE DETAILS ARE STANDARD FORMATS FOR CAD FILES. FREEHAND DRAFTED VALVE TIE DRAWINGS ARE NOT ACCEPTABLE WITHOUT PRIOR APPROVAL OF THE CITY ENGINEER.

4. EACH WATER VALVE TIE DRAWING SUBMITTED SHALL BE 3–HOLE PUNCHED.

5. WATER VALVE TIE DRAWINGS CONTAINING ANY OTHER FEATURES AND INFORMATION OR TEXT NOT PERTINENT TO VALVE TIE INFORMATION IS TO BE SHOWN GRAY–SCALED ON SHEET. I.E. STORM DRAIN, SEWER, ELEC, TREES, PARKING, ETC..

6. WATER VALVE TIE DRAWINGS ARE TO REFLECT ONLY AS–BUILT INFORMATION. ALL DIMENSIONS & COORDINATES ARE TO BE FIELD RUN. DIMENSIONS SHOULD BE SHOWN TO THE NEAREST 0.1' (TENTH OF A FOOT). WATER VALVE TIE DISTANCES EXCEEDING A MAXIMUM LENGTH OF 100.0' ARE NOT ACCEPTABLE WITHOUT PRIOR APPROVAL OF THE CITY ENGINEER. NORTHING & EASTING PER WATER VALVE WILL BE PROVIDED AND SHALL BE MD STATE PLANE COORDINATE SYSTEM NAD 83/91.

7. WATER VALVE TIE DRAWINGS ARE REQUIRED TO BE DRAWN TO SCALE.

8. ONLY ONE WATER VALVE TIE SITE IS PERMITTED TO BE SHOWN ON EACH DRAWING. MULTIPLE SITES, EVEN IF LOCATED ALONG THE SAME ROAD, ARE NOT PERMITTED TO BE SHOWN ON THE SAME DRAWING.

9. THE CITY RESERVES THE RIGHT TO REJECT AND REQUIRE THE REVISION OF ANY WATER VALVE TIE DRAWING WHICH:

   A. DOES NOT COMPLY WITH THE REQUIREMENTS SET FORTH IN THE CITY STANDARD DETAILS W–21.0 AND W–21.1.

   B. DOES NOT FURNISH ADEQUATE INFORMATION TO IDENTIFY THE VALVE SITE.

   C. IS NOT DRAFTED NEATLY AND LEGIBLY ON THE STANDARD WATER VALVE TIE SHEET FORMAT.

   D. HAS BEEN SPOT CHECKED IN THE FIELD AND FOUND TO BE INACCURATE IN SITE REPRESENTATION, HAS INACCURATE WATER VALVE TIE MEASUREMENTS AND/OR DOES NOT REFLECT AS–BUILT CONDITIONS.

   E. DOES NOT HAVE THE FIELD VERIFICATION CERTIFICATE COMPLETED WITH THE DATE OF THE WATER VALVE TIE FIELD VERIFIED MEASUREMENTS AND DOES NOT HAVE THE CERTIFICATION SIGNED AND DATED BY A MARYLAND REGISTERED LAND SURVEYOR INCLUDING THE SURVEYOR'S REGISTRATION NUMBER.

   F. DOES NOT SHOW ALL REQUIRED VALVE TIE MEASUREMENTS (MINIMUM OF 2 TO EACH VALVE) SHOWN IN FEET TO THE NEAREST TENTH OF A FOOT.

   G. HAS MEASUREMENTS WHICH EXCEED THE MAXIMUM ALLOWABLE DISTANCE OF 100.0' WITHOUT PRIOR APPROVAL OF THE CITY ENGINEER.

   H. DOES NOT SHOW ALL VALVES WHICH WILL BE MAINTAINED BY THE CITY.

   I. DOES NOT TIE WATER VALVES TO ACCEPTABLE PERMANENT STRUCTURES (NON–PERMANENT STRUCTURES MAY BE USED ONLY WITH PRIOR APPROVAL OF THE CITY ENGINEER).

   J. DOES NOT HAVE ALL TITLE BLOCK INFORMATION COMPLETED WITH THE EXCEPTION OF THE PAGE NUMBER WHICH WILL BE ASSIGNED BY THE CITY ENGINEERING STAFF.

   K. DOES NOT HAVE ALL FEATURES PROPERLY LABELED.

   L. DOES NOT HAVE A NORTH ARROW.

   M. DOES NOT INCLUDE COMPLETED WATER VALVE COORDINATE TABLE

The City of Frederick Maryland

WATER VALVE TIE STANDARD SHEET GENERAL NOTES

APPROVED: Zachary J. Kershner

DIRECTOR–DEPARTMENT PUBLIC WORKS

W-21.0

MARCH 2017

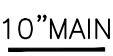
NOTES:

10. A MINIMUM OF 2 DIMENSIONS DESIGNATED IN FEET TO THE NEAREST TENTH OF A FOOT FROM EACH WATER VALVE TO 2 DIFFERENT ACCEPTABLE PERMANENT STRUCTURES. WHEN A BUILDING IS USED TO TIE DOWN THE LOCATION OF A WATER VALVE, DIMENSIONS MAY BE TAKEN FROM DIFFERENT CORNERS OF THE SAME BUILDING (THIS WILL SATISFY THE 2 DIMENSION REQUIREMENT FOR THAT WATER VALVE). WHERE A FIRE HYDRANT EXISTS, ONE OF THE 2 VALVE TIE DIMENSIONS IS REQUIRED TO BE FROM THE HYDRANT TO THE WATER VALVE ON THE HYDRANT LINE. WATER VALVES ARE REQUIRED TO BE TIED BY DIMENSION TO THE NEAREST ACCEPTABLE PERMANENT STRUCTURE (MANHOLE COVER, INLET, STREET LIGHT POLE, FIRE HYDRANT, CORNER OF A PERMANENT BUILDING, ETC.). AN ACCEPTABLE PERMANENT STRUCTURE IS ONE WHICH IS NOT EXPECTED TO CHANGE IN CONDITION OR LOCATION. WATER VALVES SHALL NOT BE TIED TO UNACCEPTABLE OR NON–PERMANENT STRUCTURES (TREES, FENCE POSTS, PORCHES, STEPS, SHEDS, ETC.). A NON–PERMANENT STRUCTURE IS ONE WHOSE CONDITION AND LOCATION IS AFFECTED MORE READILY BY SEVERE WEATHER CONDITIONS, HOME REPAIRS, RENOVATIONS, ACCIDENTS, ETC. IF A SITUATION ARISES WHERE THERE ARE NO ACCEPTABLE PERMANENT STRUCTURES AVAILABLE THEN NON–PERMANENT STRUCTURES MAY BE USED ONLY WITH THE PRIOR APPROVAL OF CITY ENGINEER.

REQUIRED VALVE-TIE SHEET SYMBOLS

 = BUILDING HATCH (ANSI 131)

 = WATER VALVE

 = WATER MAIN

 = FIRE HYDRANT

 = WATER METER

 = CURB LINE

 = LIGHT POLE

The City of Frederick Maryland

WATER VALVE TIE STANDARD SHEET GENERAL NOTES

APPROVED: Zachary J. Kershner

DIRECTOR–DEPARTMENT PUBLIC WORKS

W-21.1

MARCH 2017

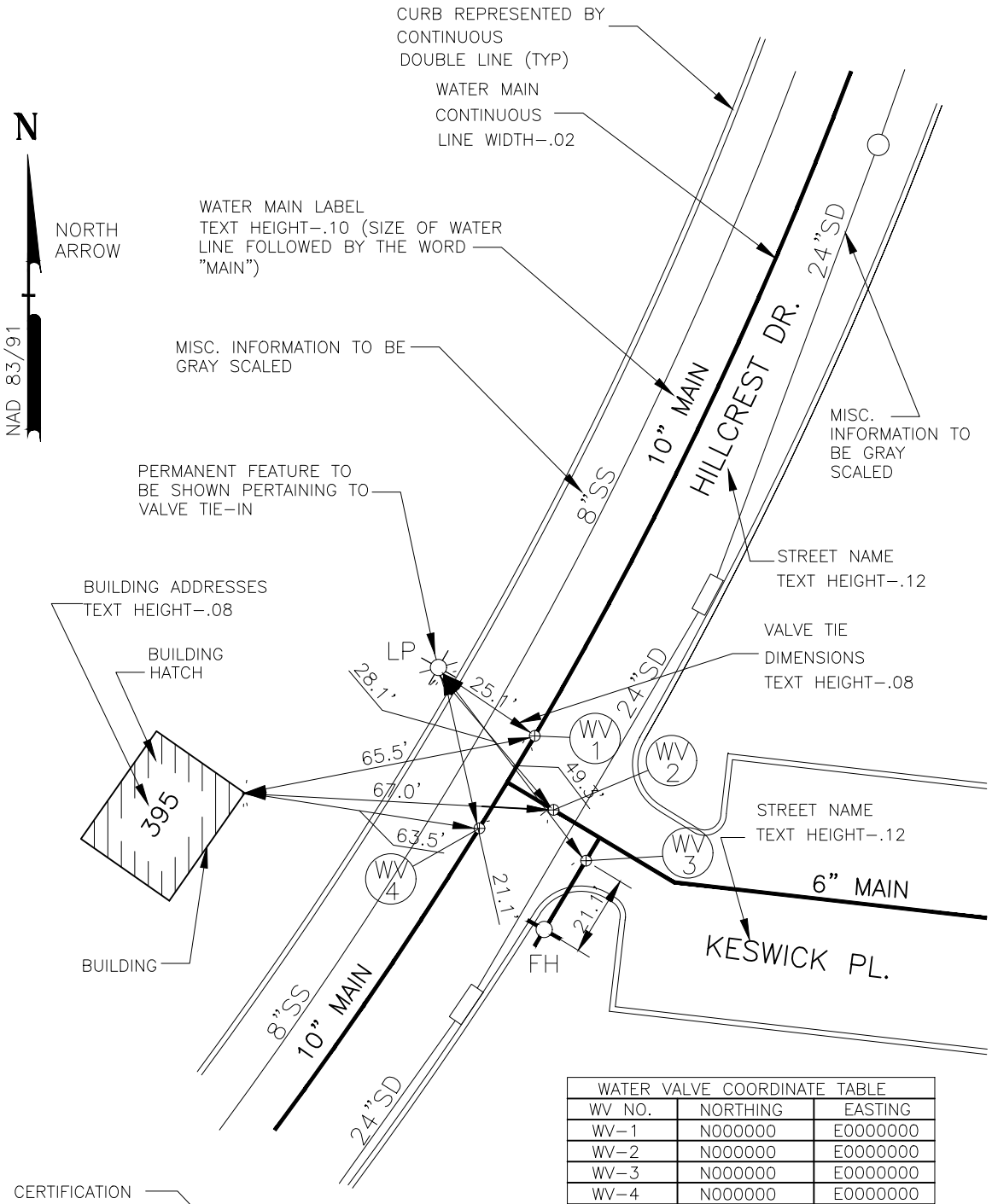
PAGE NUMBER ASSIGNED BY CITY STAFF

WATER VALVE	DATE: 1-15-15	SCALE: 1"=20'	PAGE: 725

SUBDIVISION: EXAMPLE-FREDERICK HEIGHTS

LOCATION: EXAMPLE- HILLCREST DR. & KESWICK PL.

PREPARED BY: EXAMPLE- ABC CONSULTING



WATER VALVE COORDINATE TABLE		
WV NO.	NORTHING	EASTING
WV–1	N000000	E0000000
WV–2	N000000	E0000000
WV–3	N000000	E0000000
WV–4	N000000	E0000000

CERTIFICATION

THE WATER VALVE TIE DIMENSIONS SHOWN HAVE BEEN FIELD VERIFIED ON (DATE) 00-00-00 AND THE INFORMATION HEREON IS AS-BUILT.

John Doe MD. REG. #00 01-01-09

MARYLAND REGISTERED LAND SURVEYOR SIGNATURE & MARYLAND REGISTRATION NUMBER — DATE

NOTE:

1. THIS DRAWING IS A FULL SIZE REPRESENTATION OF THE STANDARD WATER VALVE TIE SHEET.

AS-BUILT